



Point Curvature: Large
Aspect Ratio: Small ($\div 1$)

FIG. 1A PRIOR ART



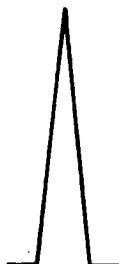
Point Curvature: Little Small
Aspect Ratio: Small ($\div 4.5$)

FIG. 1B PRIOR ART



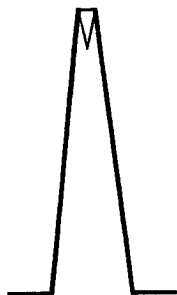
Point Curvature: Little Small
Aspect Ratio: Small ($\div 1$)

FIG. 1C PRIOR ART



Point Curvature: Small (Several nm)
Aspect Ratio: Large (≈ 10)

FIG. 1D PRESENT INVENTION



Point Curvature: Small (Several nm)
Aspect Ratio: Large (≈ 10)

FIG. 1E PRESENT INVENTION

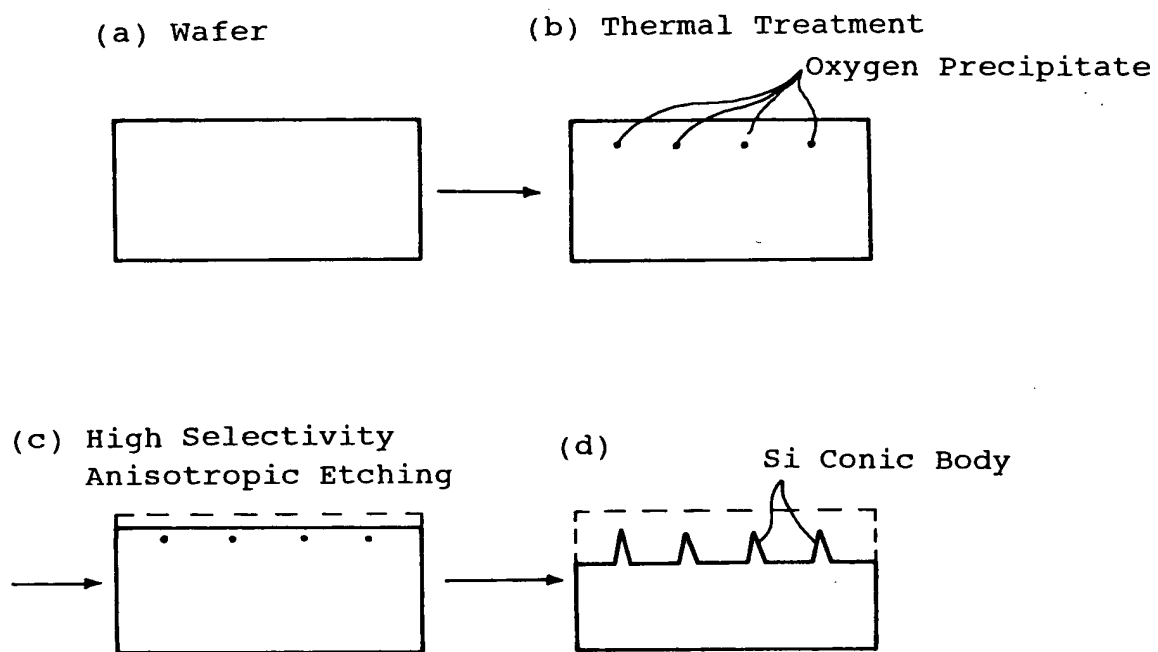


FIG. 2

FIG. 3A

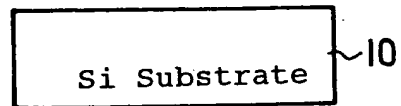


FIG. 3B

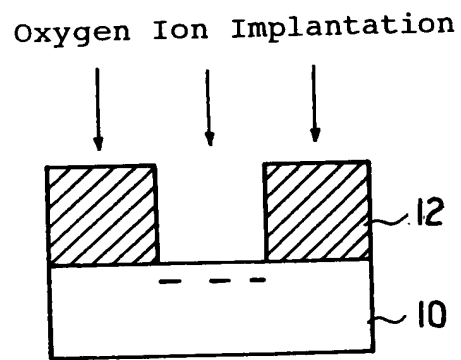


FIG. 3C

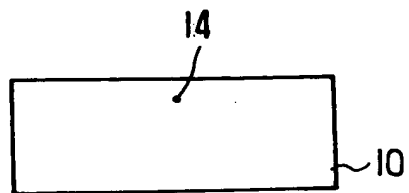
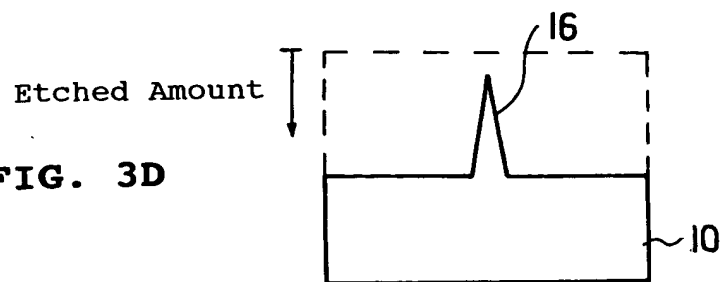


FIG. 3D



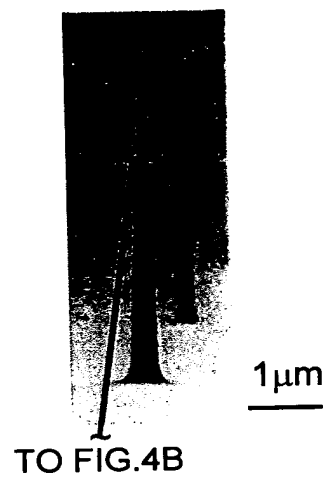


FIG.4A

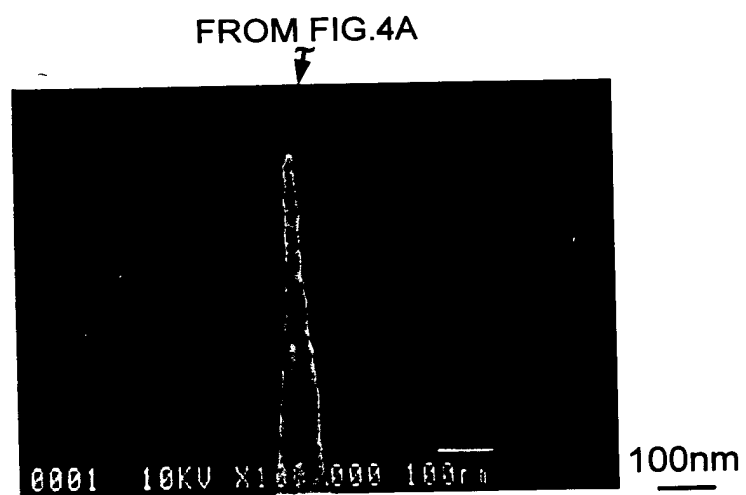


FIG.4B

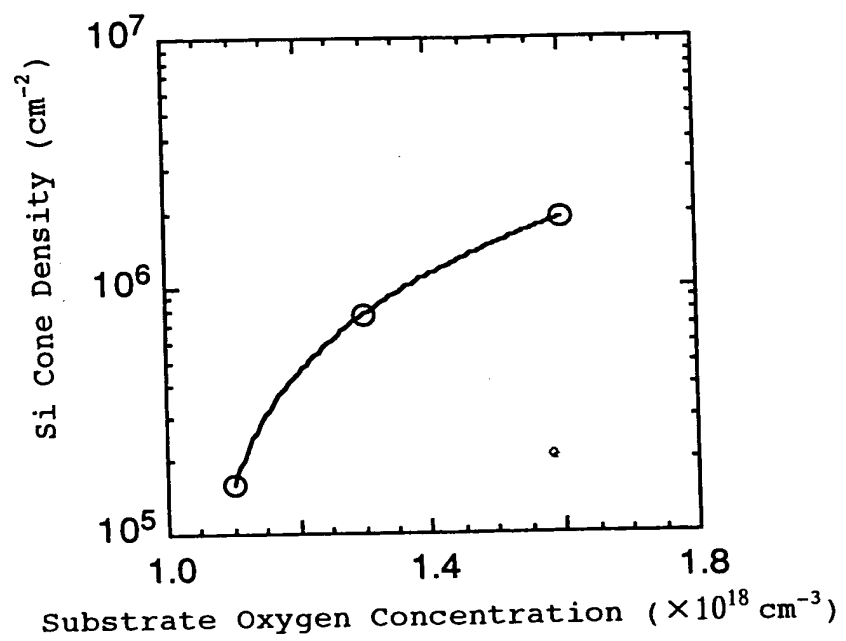


FIG. 5

B Implantation Amount:
 $7 \times 10^{13} \text{ cm}^{-2}$



100 μm

FIG.6A

B Implantation Amount:
 $1 \times 10^{14} \text{ cm}^{-2}$



100 μm

Black dots
are silicon needle conic bodies.

FIG.6B

FIG. 7A

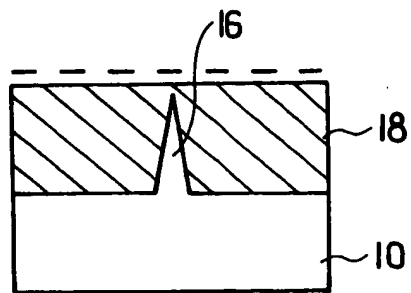


FIG. 7B

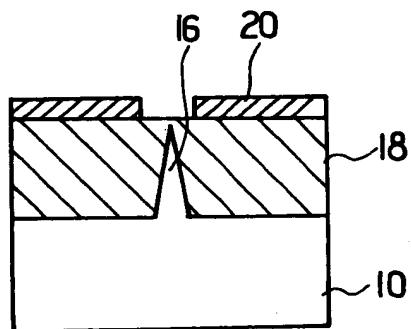
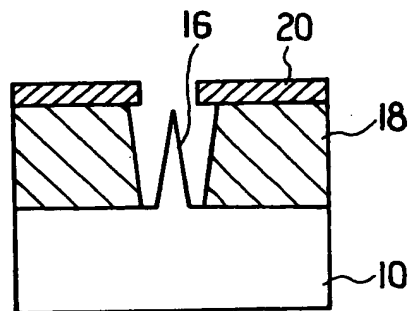


FIG. 7C



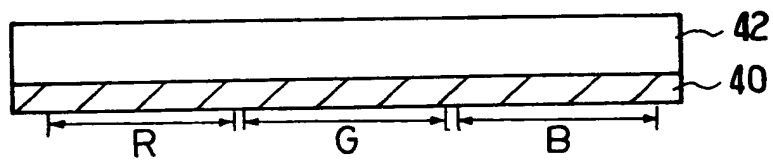


FIG. 8A

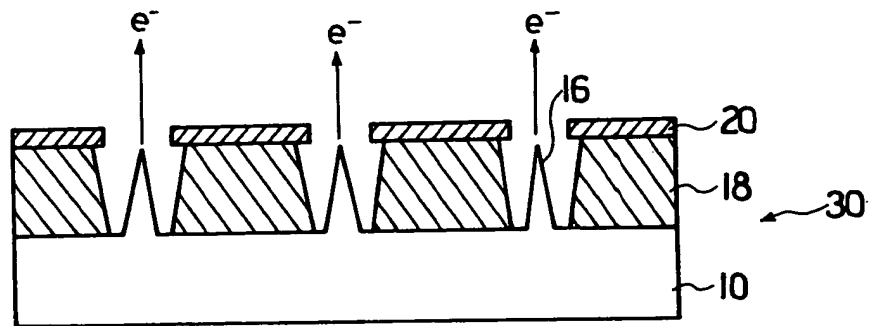
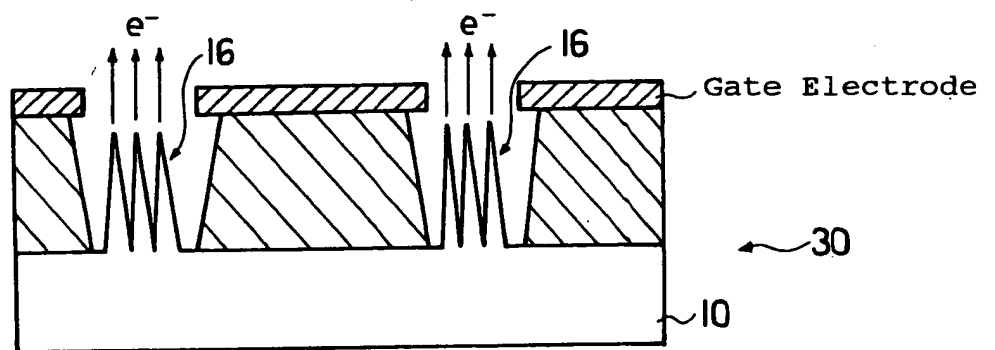


FIG. 8B



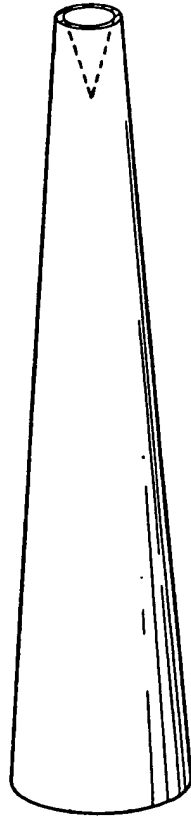


FIG. 9A

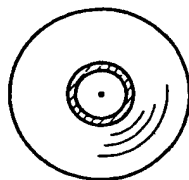
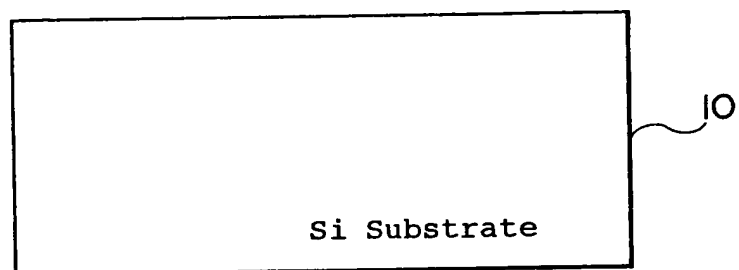


FIG. 9B

FIG. 10A



Oxygen Ion Implantation



FIG. 10B

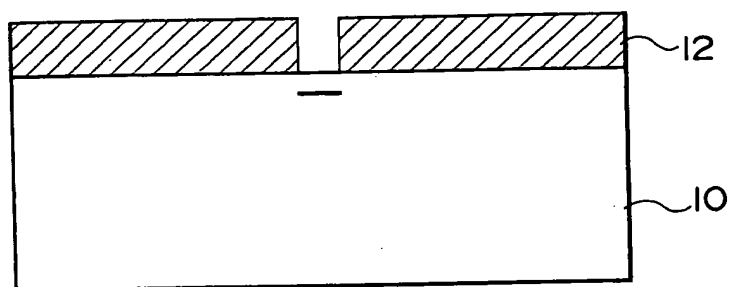


FIG. 10C

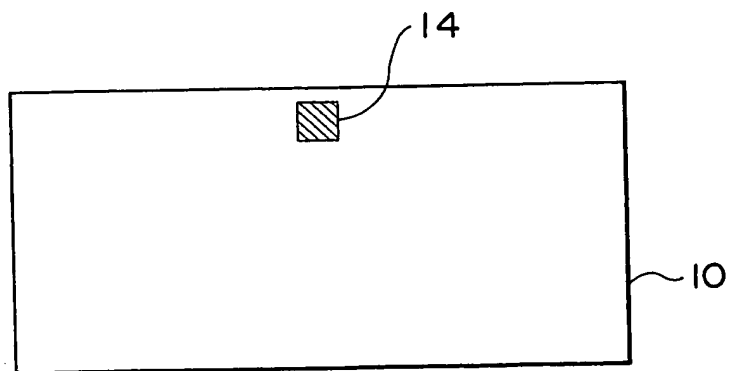


FIG. 10D

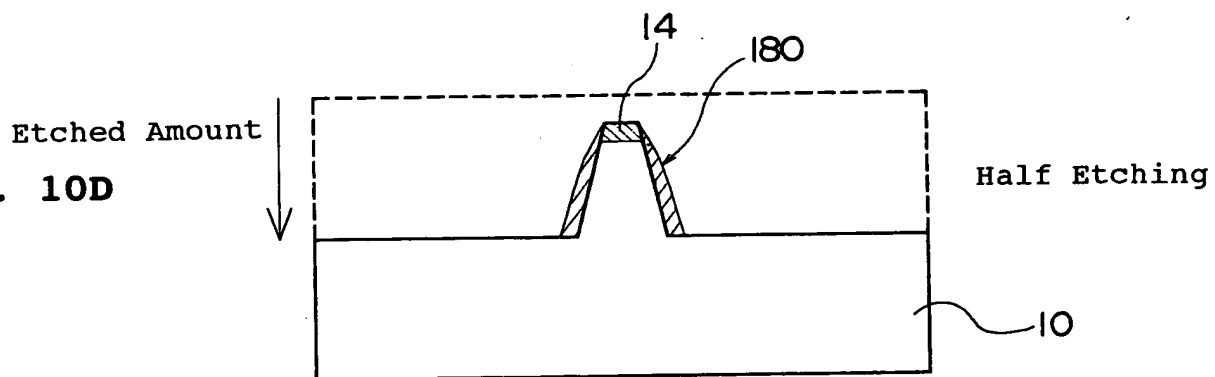


FIG. 10E

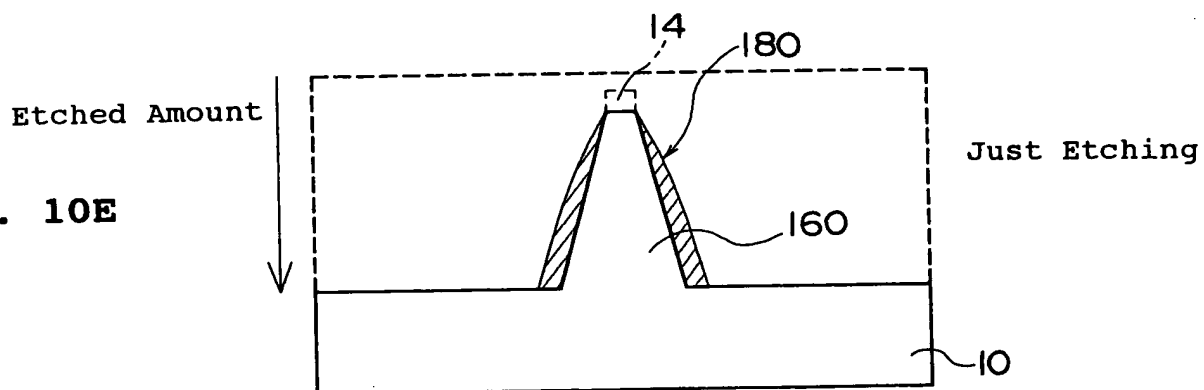
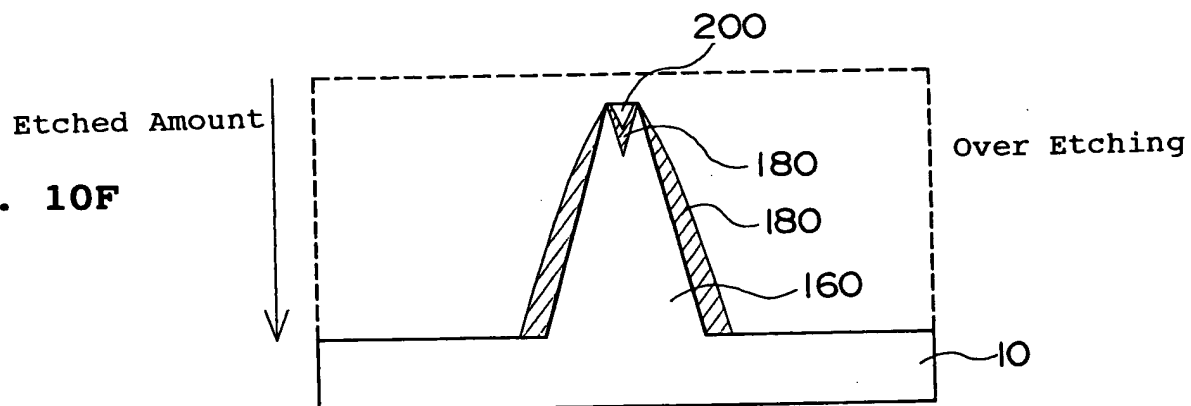


FIG. 10F



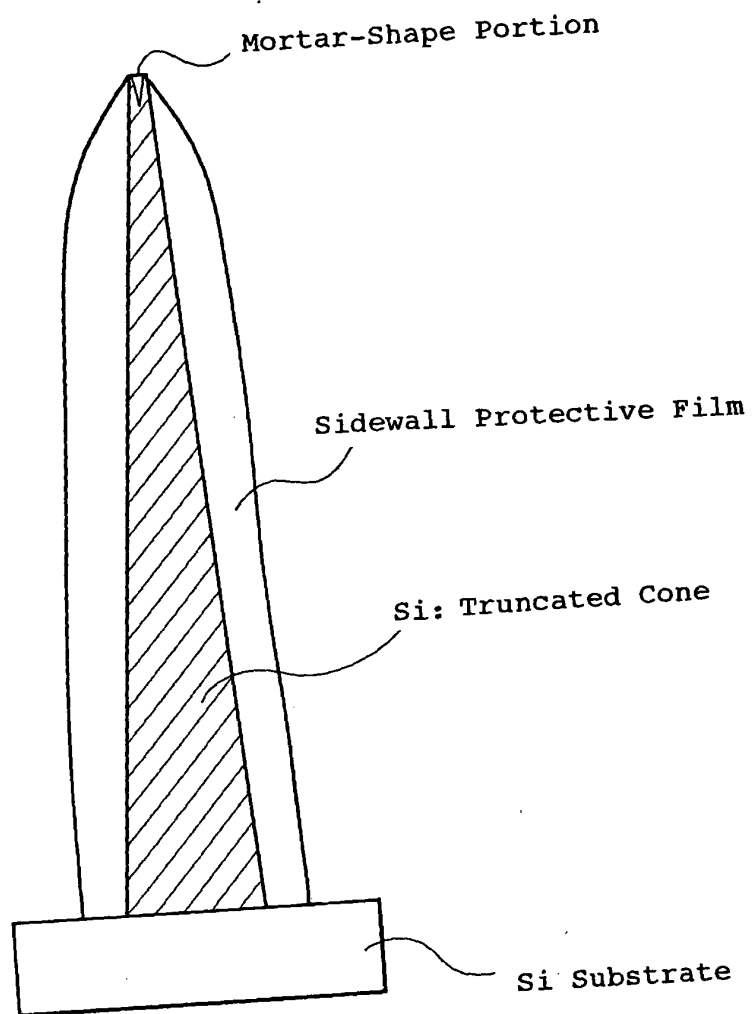


FIG. 11

FIG. 12A

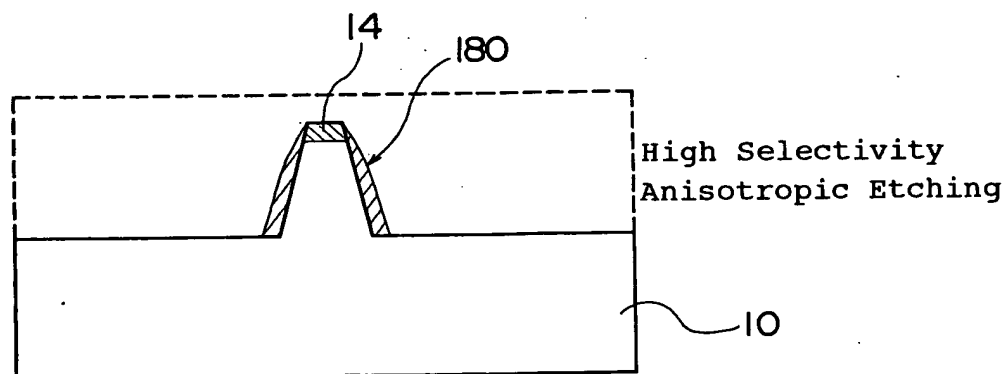


FIG. 12B

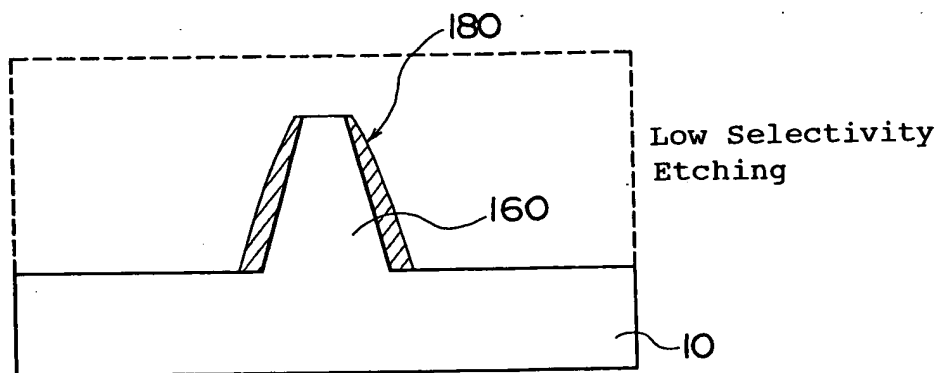


FIG. 12C

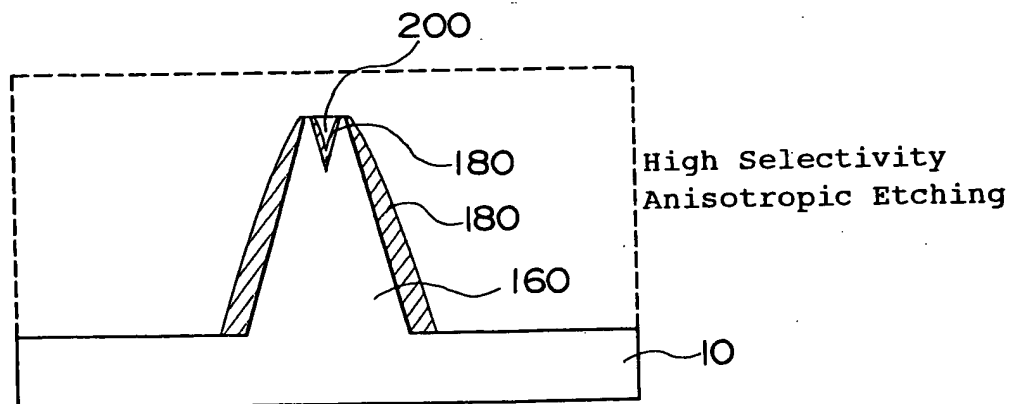


FIG. 13A

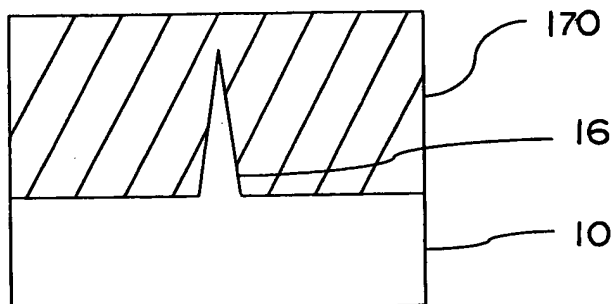


FIG. 13B

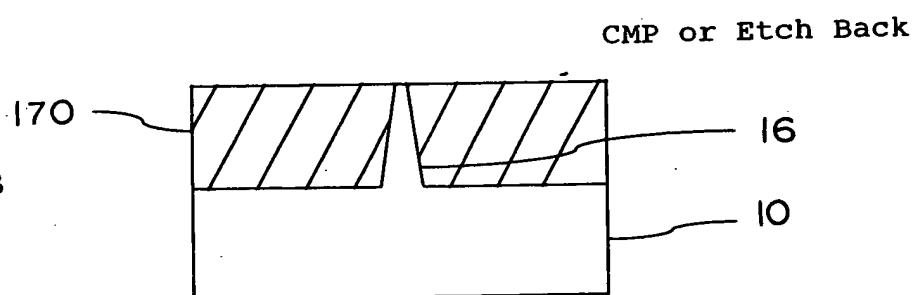


FIG. 13C

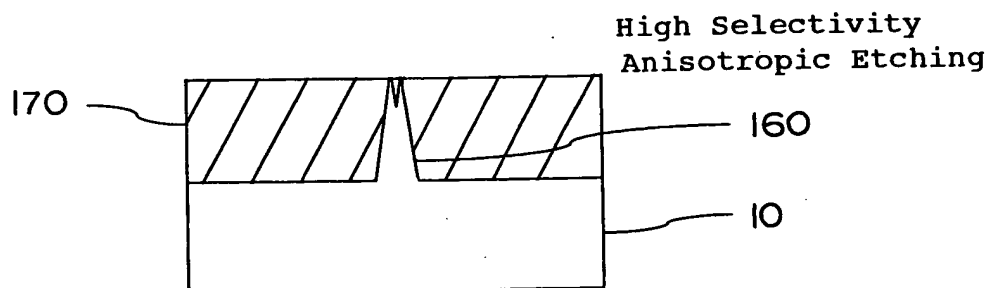
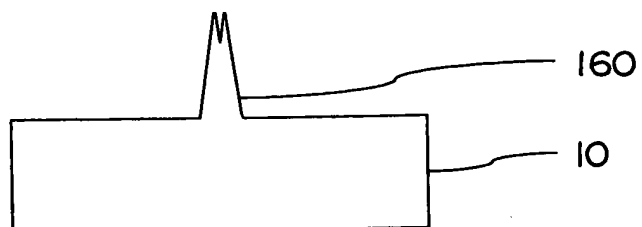


FIG. 13D



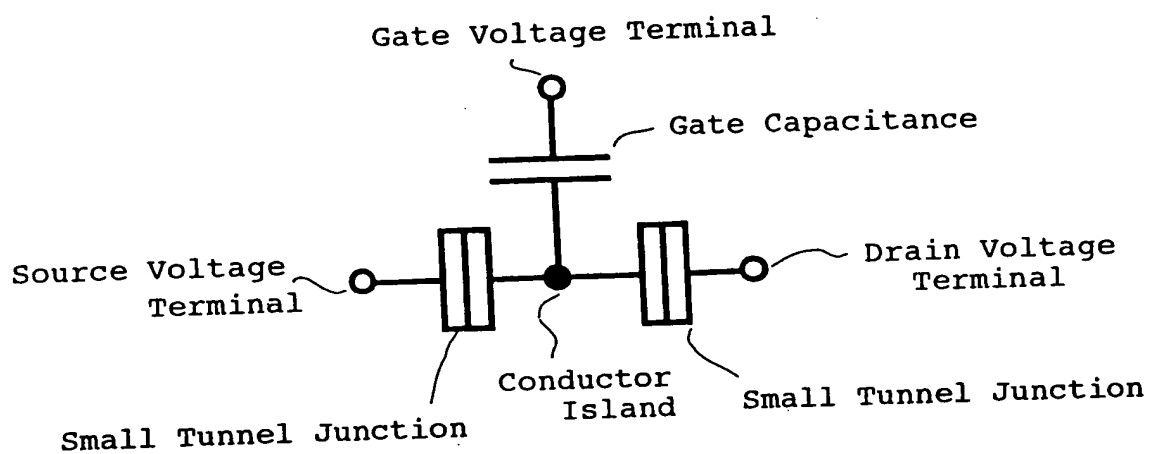


FIG. 14A PRIOR ART

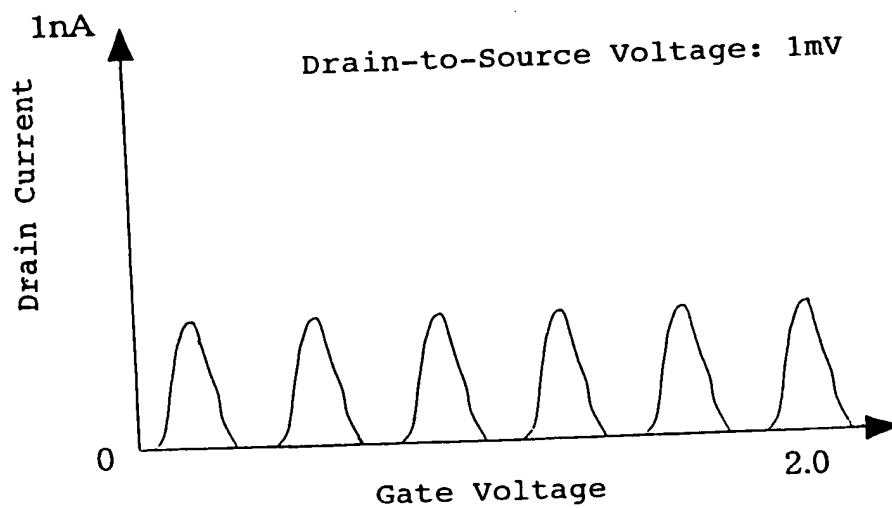


FIG. 14B PRIOR ART

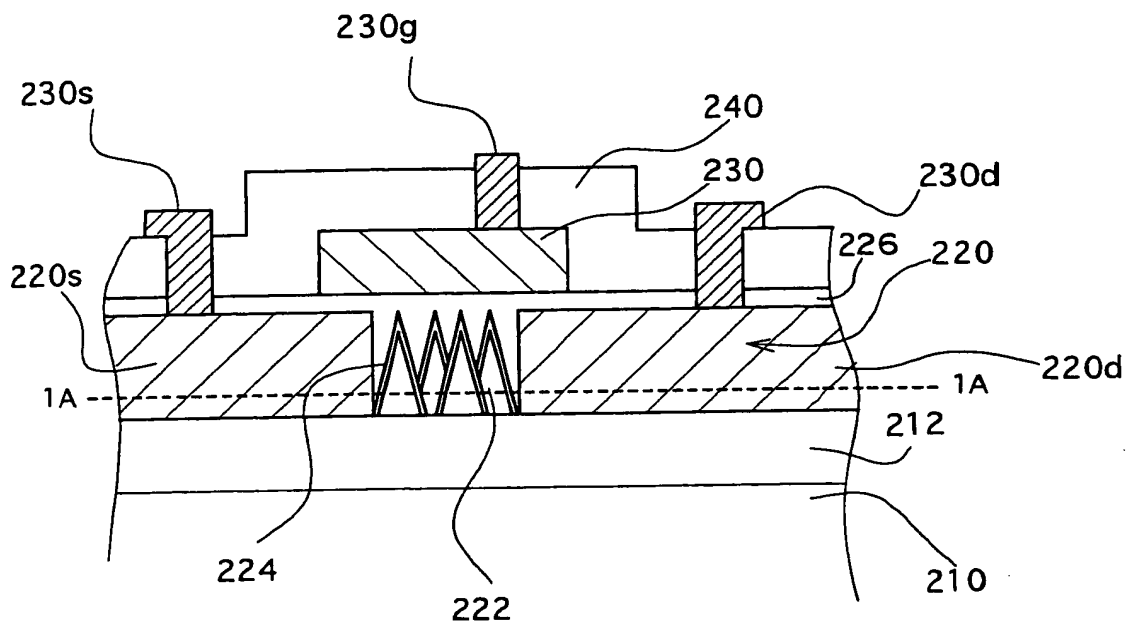


FIG. 15A

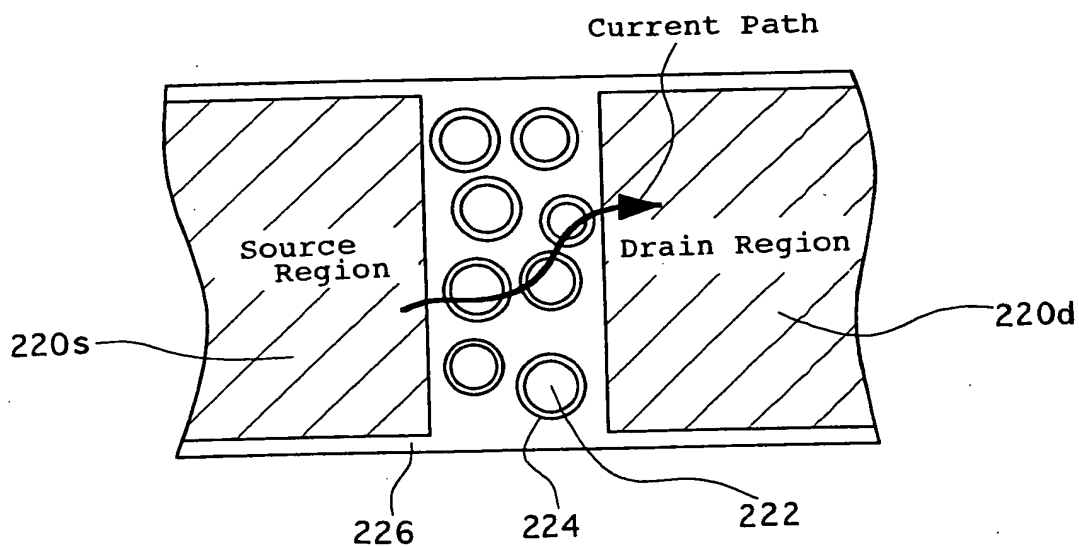


FIG. 15B

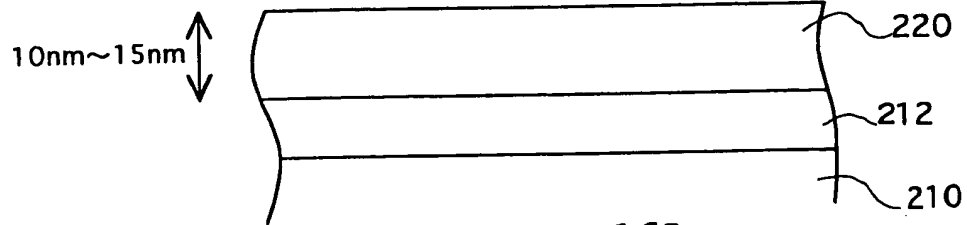


FIG. 16A

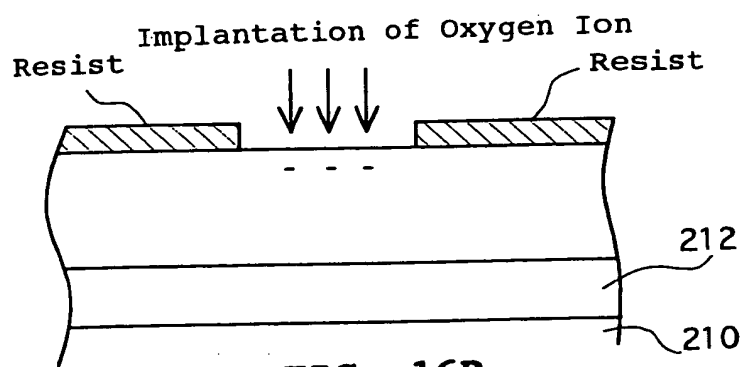


FIG. 16B

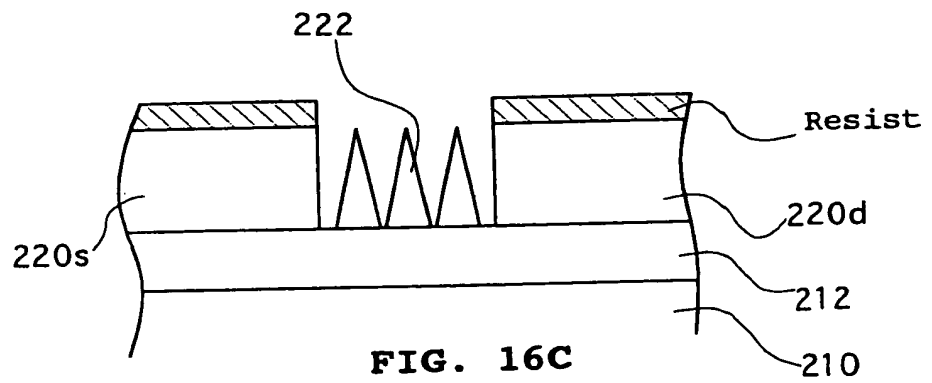


FIG. 16C

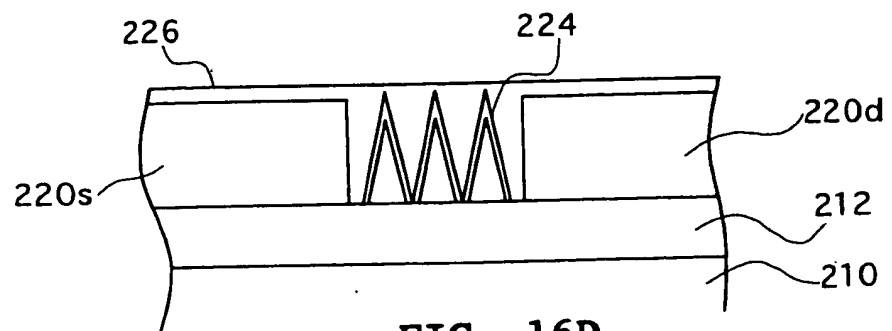


FIG. 16D

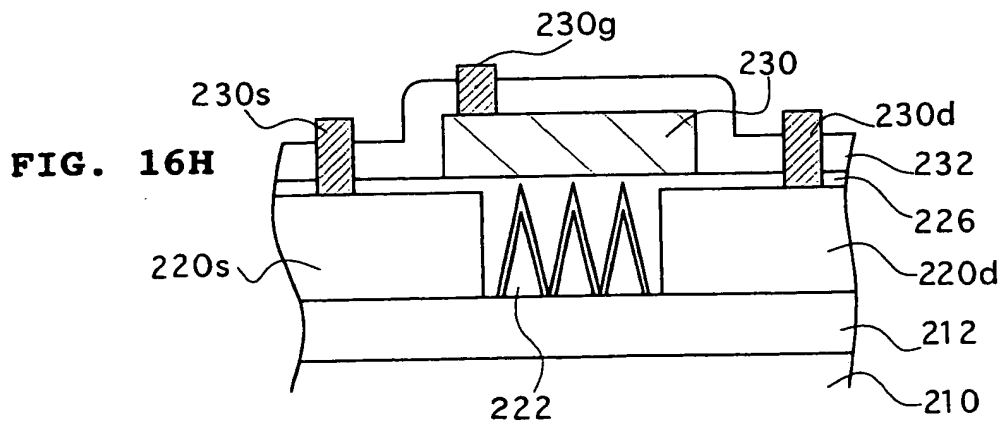
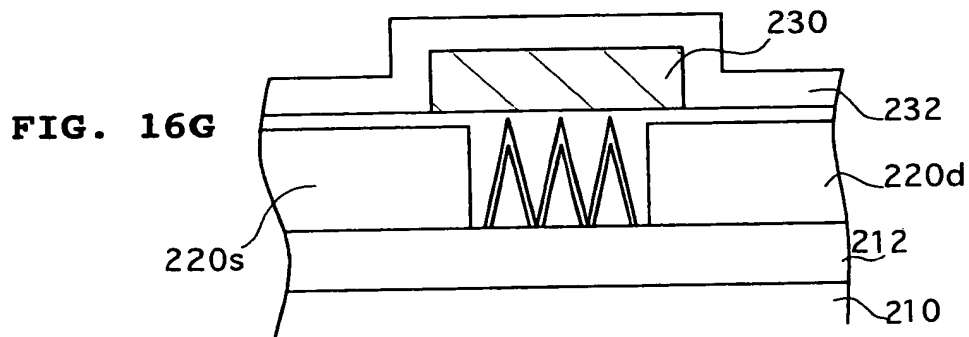
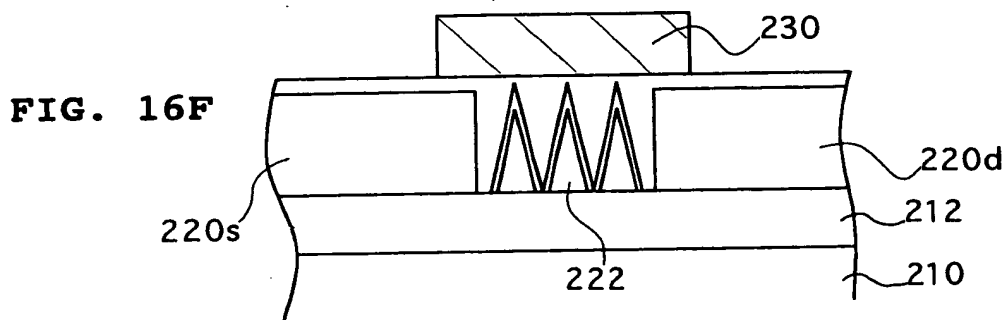
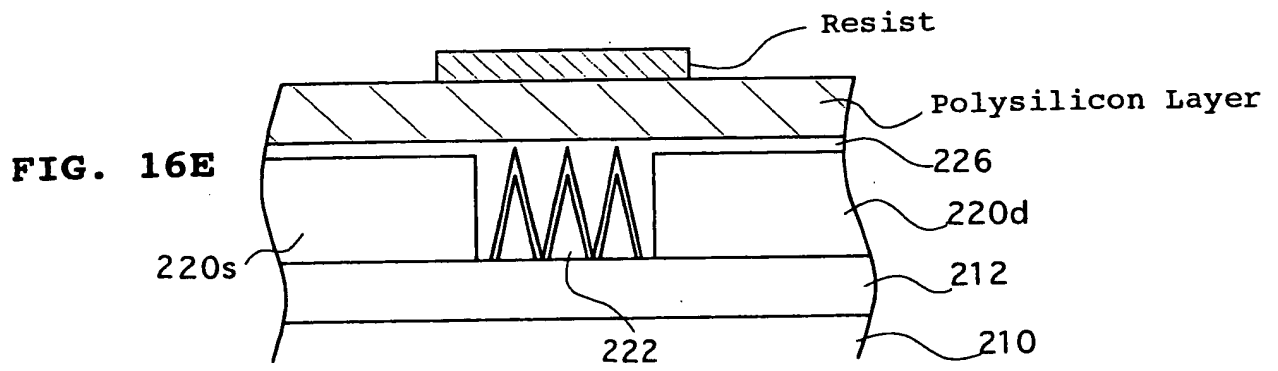
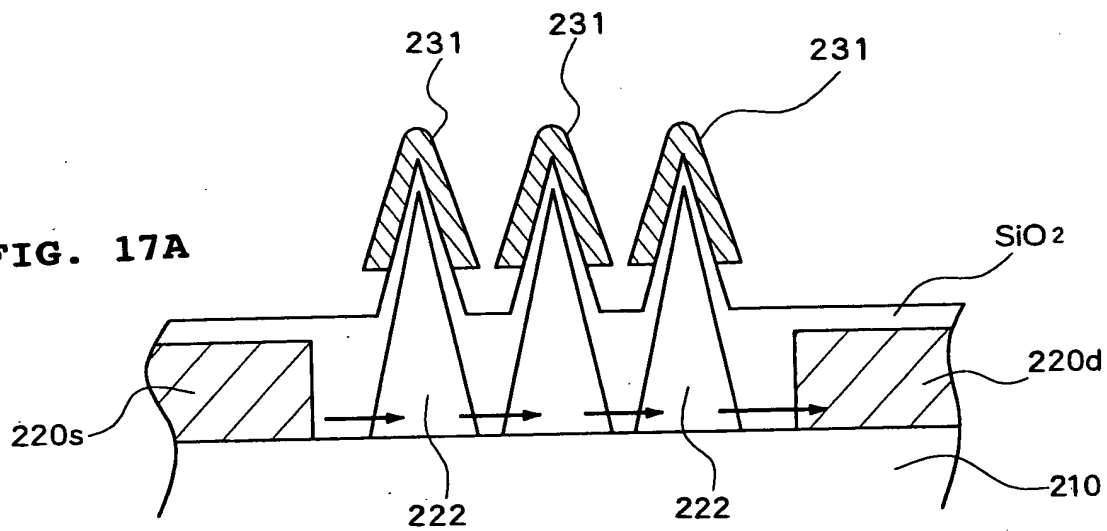


FIG. 17A



Selective Gate Control

FIG. 17B

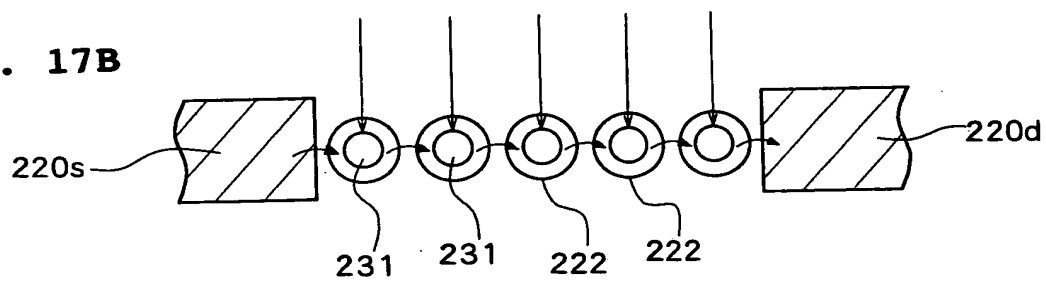
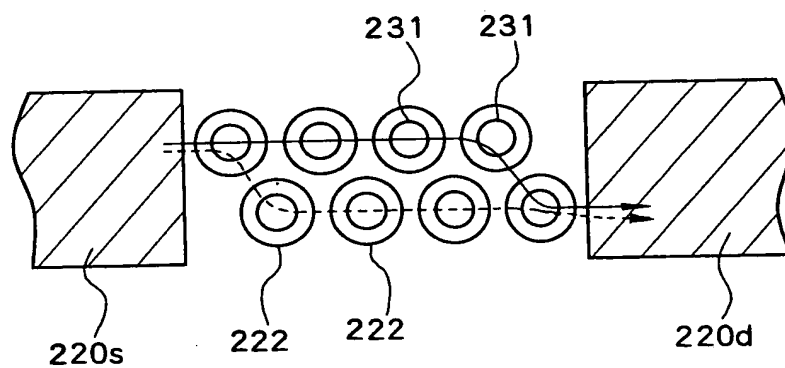


FIG. 17C



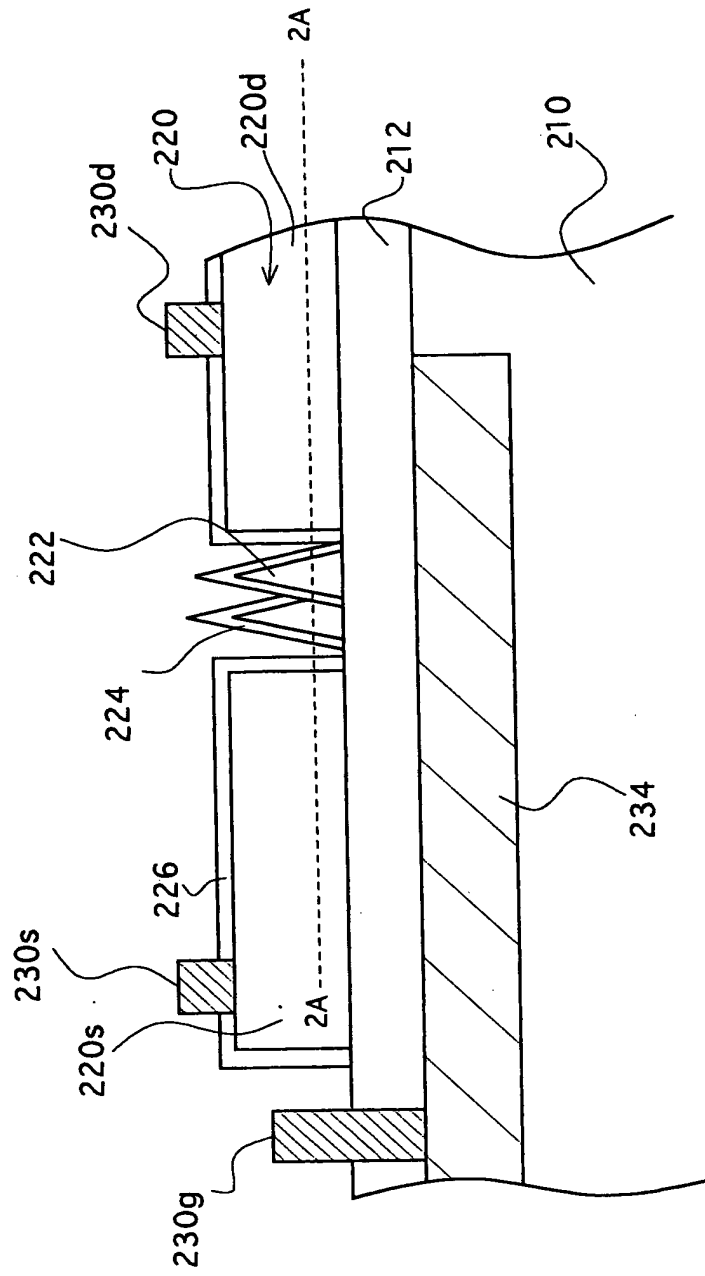


FIG. 18

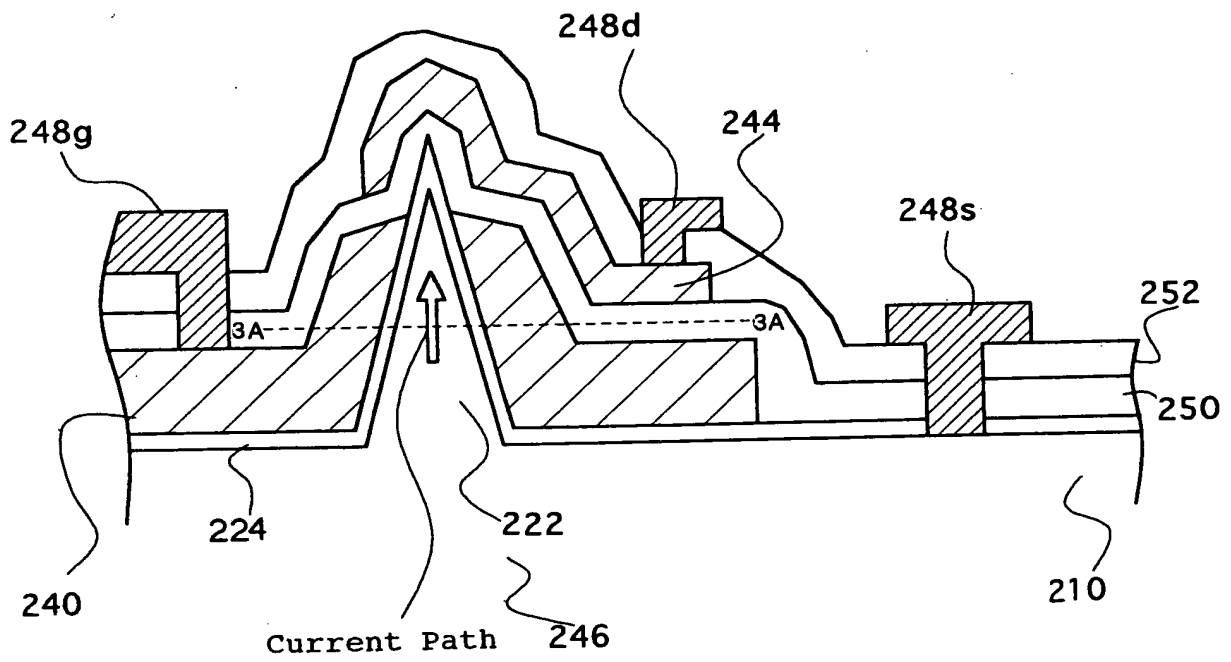


FIG. 19A

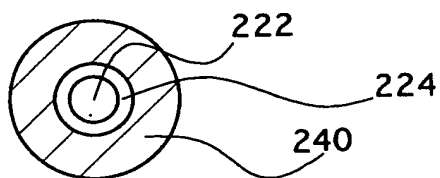


FIG. 19B

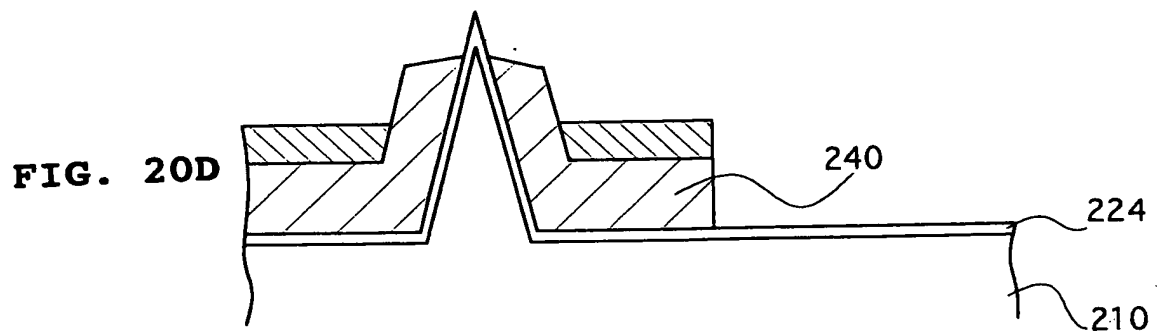
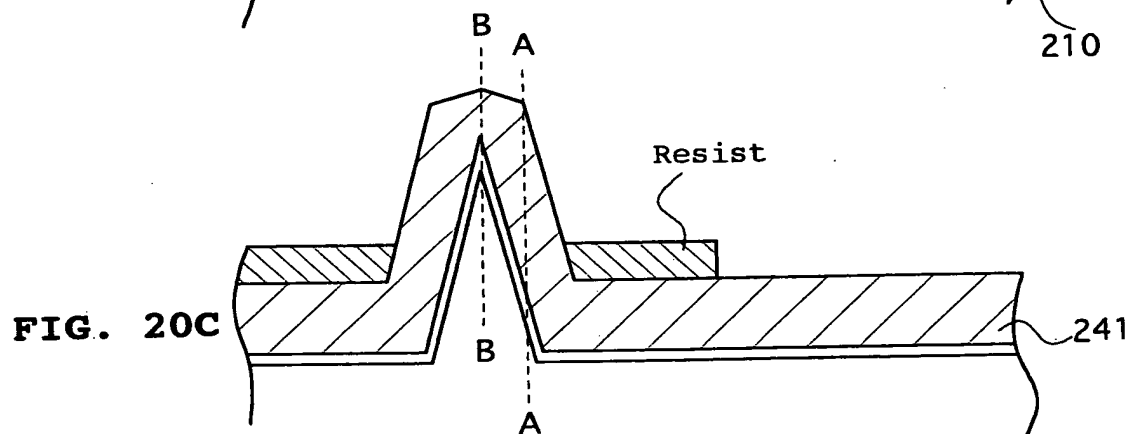
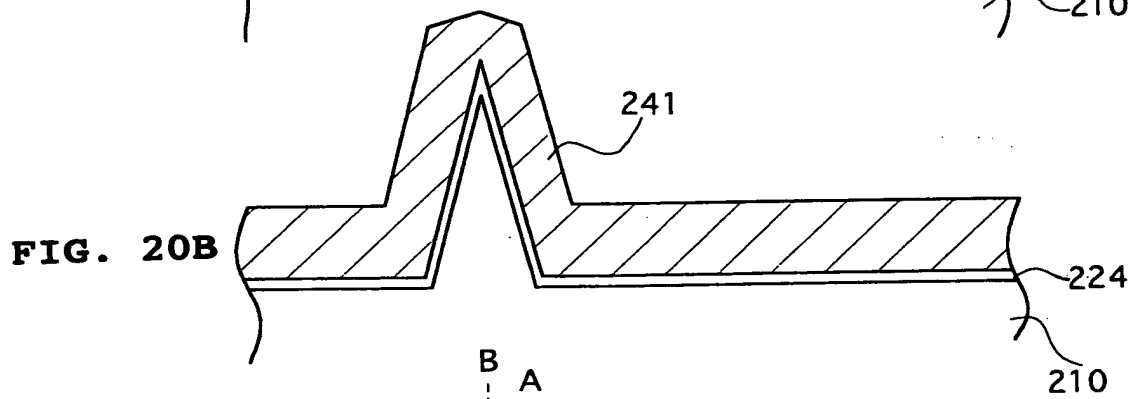
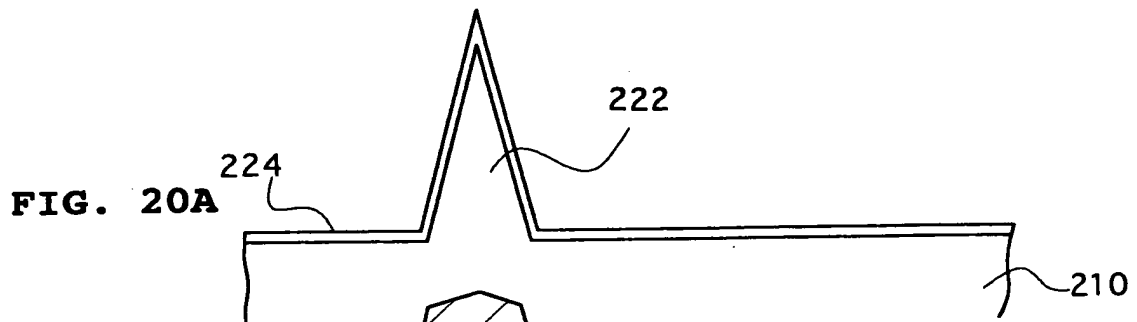


FIG. 20E

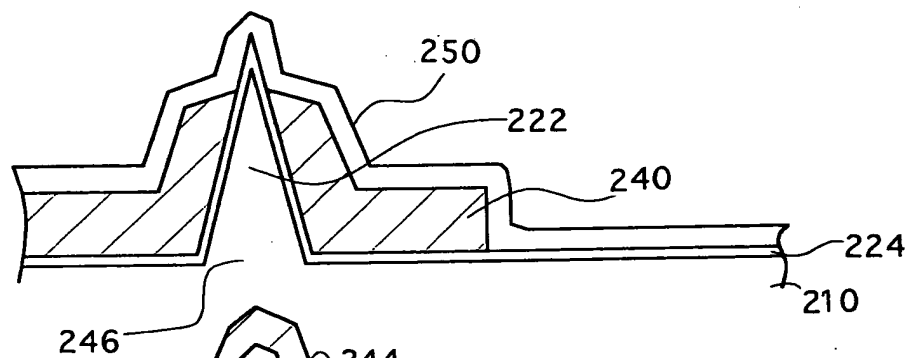


FIG. 20F

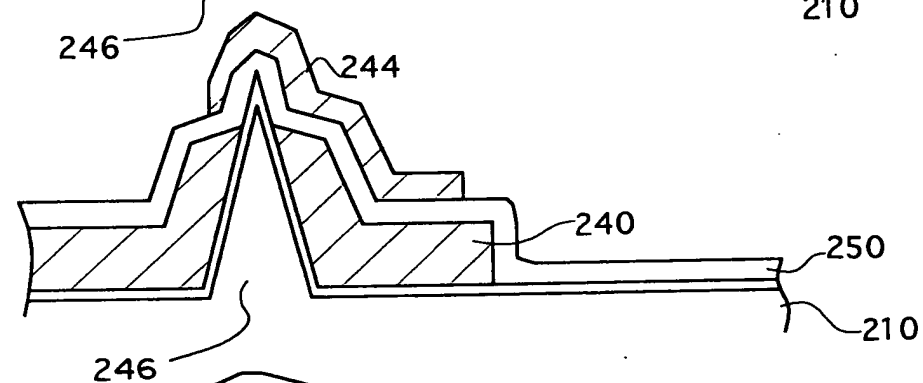


FIG. 20G

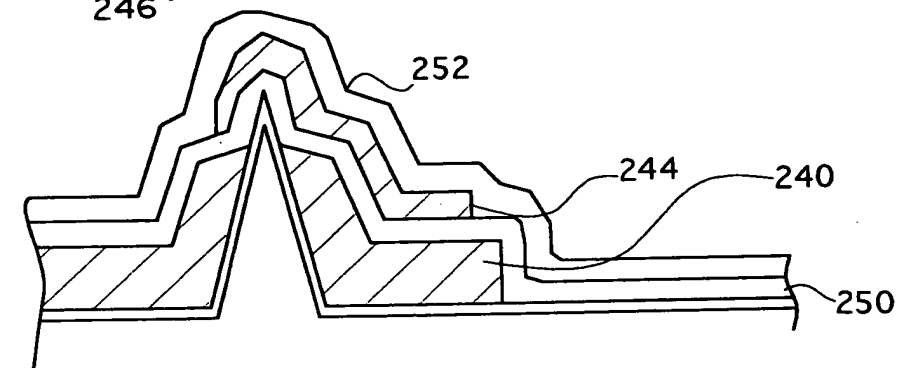
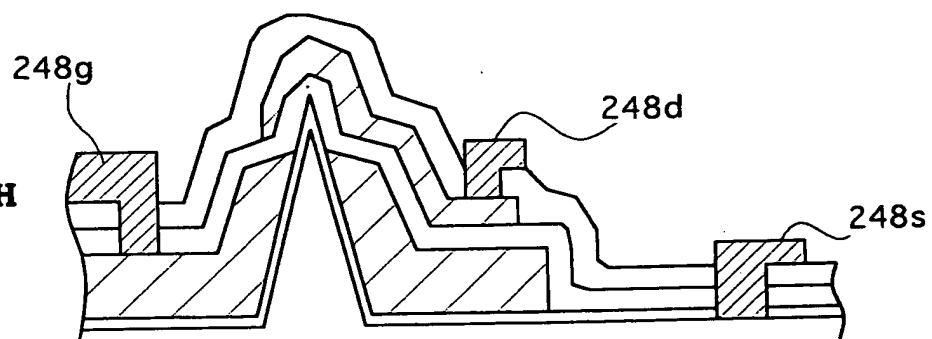


FIG. 20H



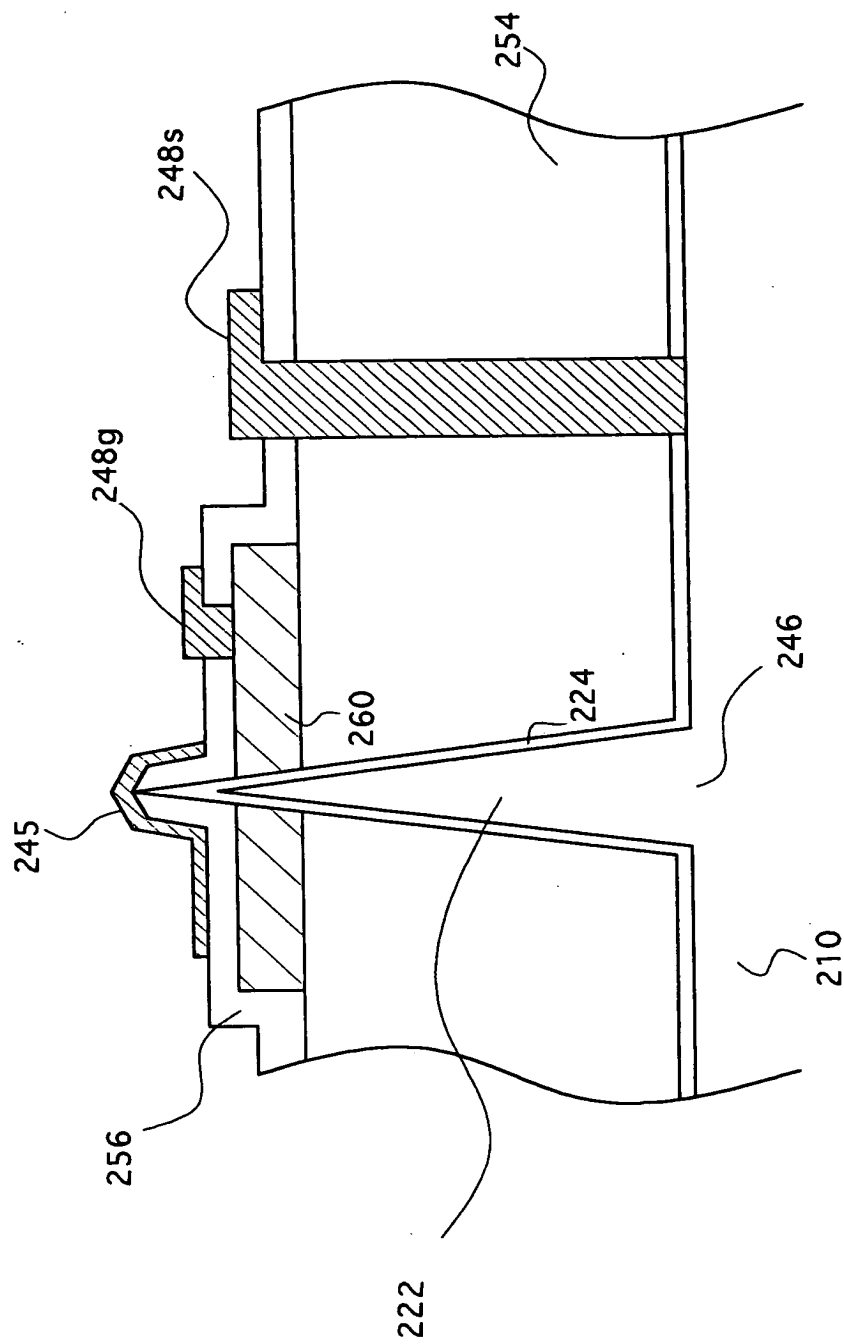


FIG. 21

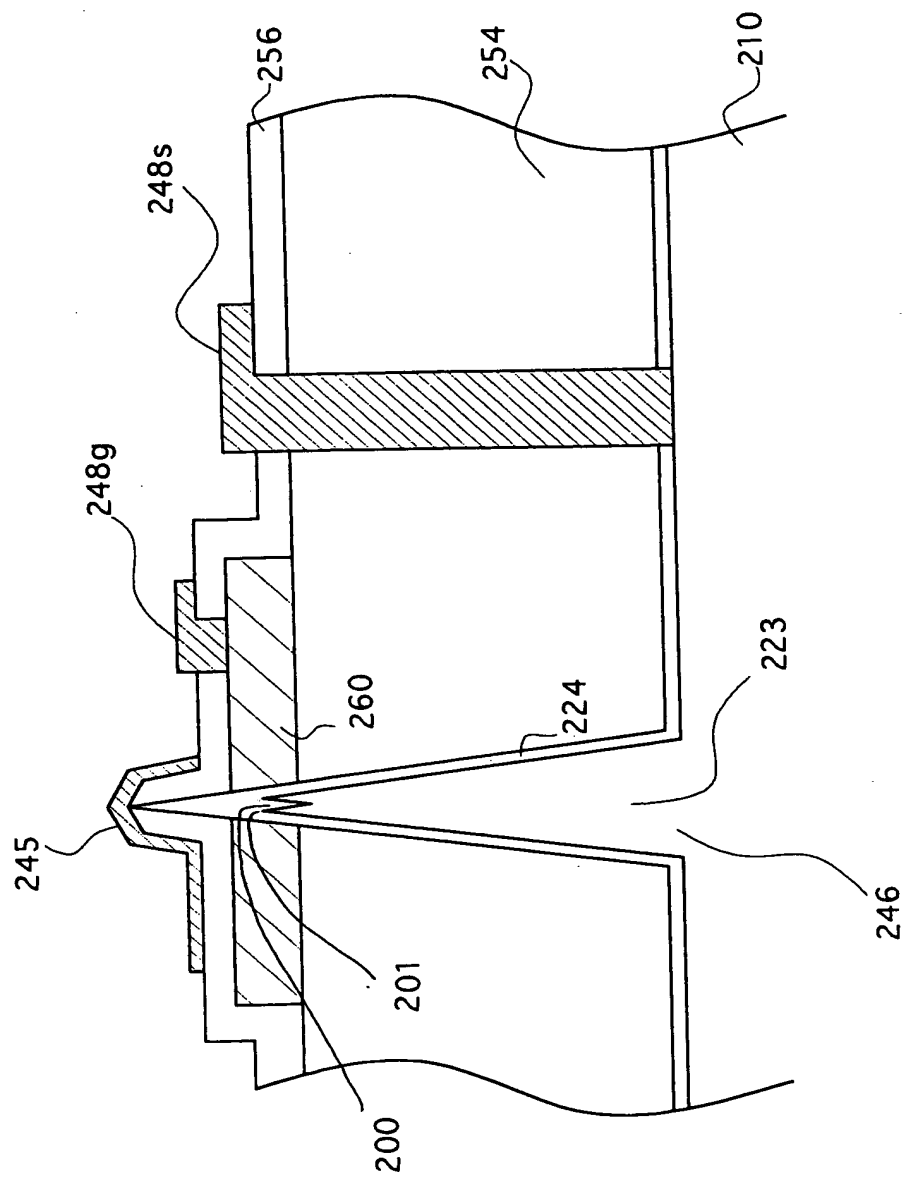


FIG. 22

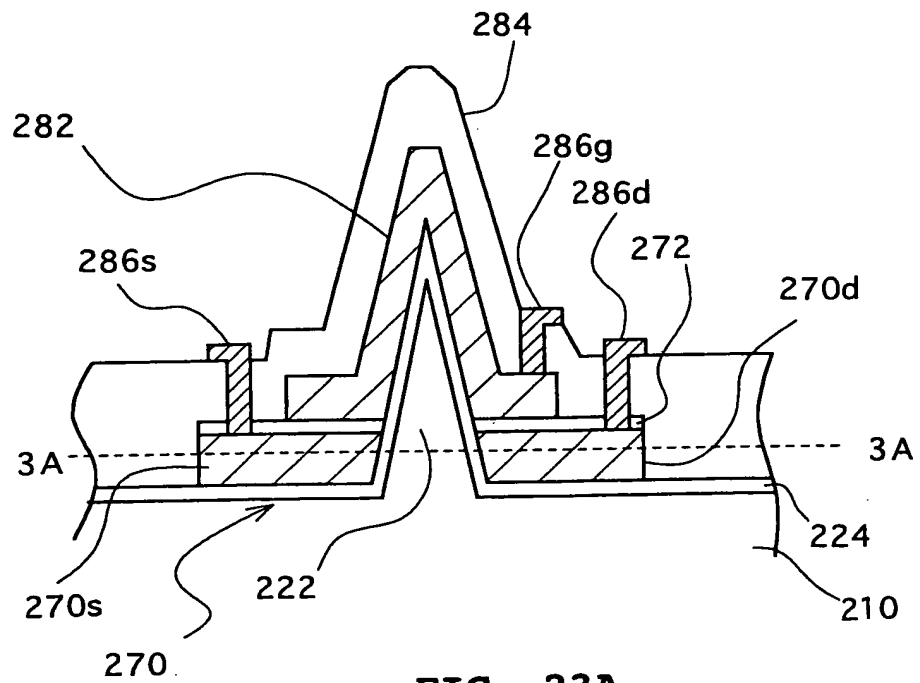


FIG. 23A

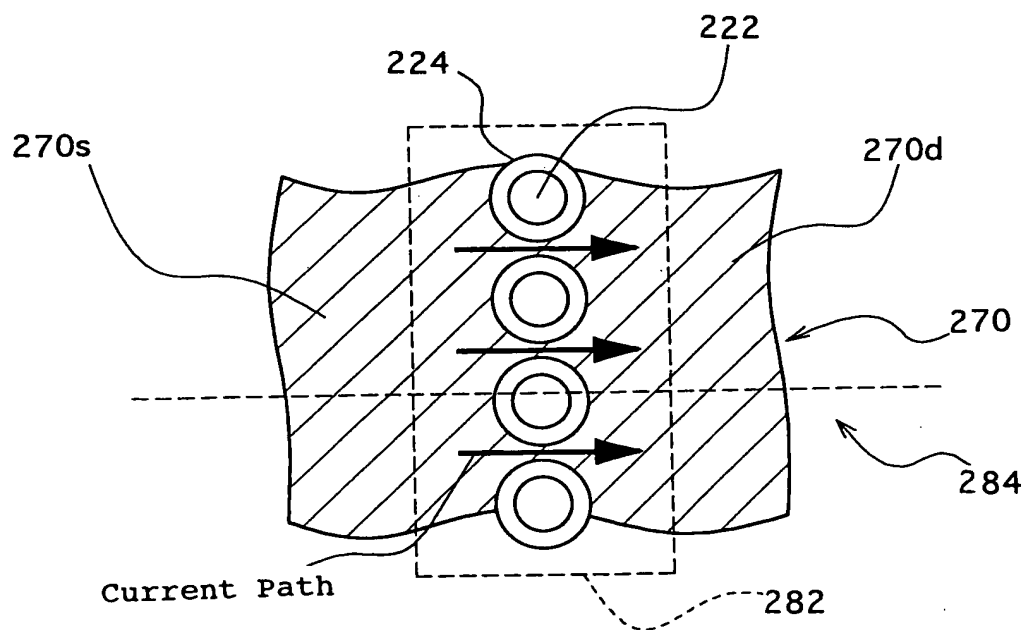


FIG. 23B

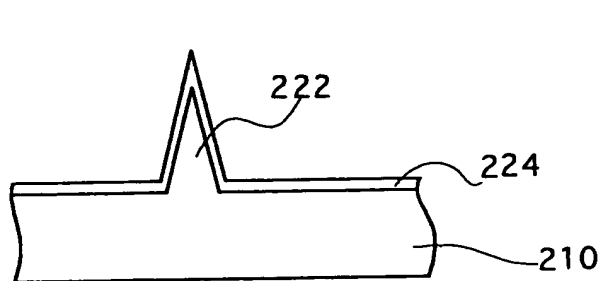


FIG. 24A

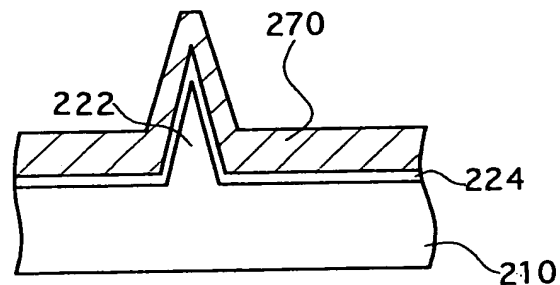


FIG. 24B

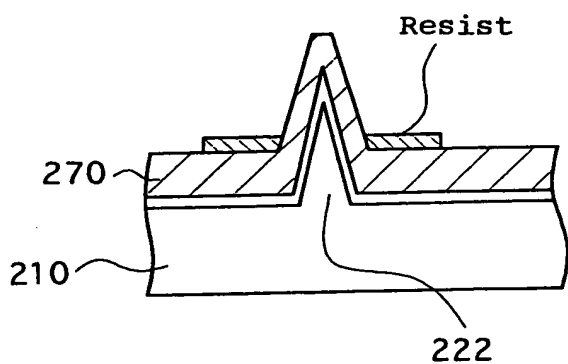


FIG. 24C

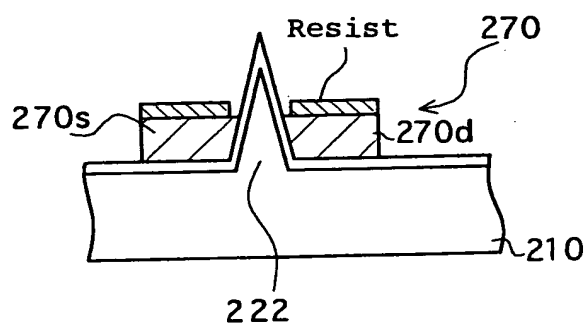


FIG. 24D

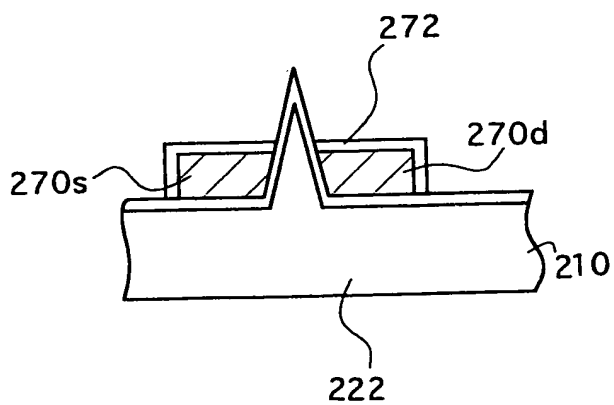
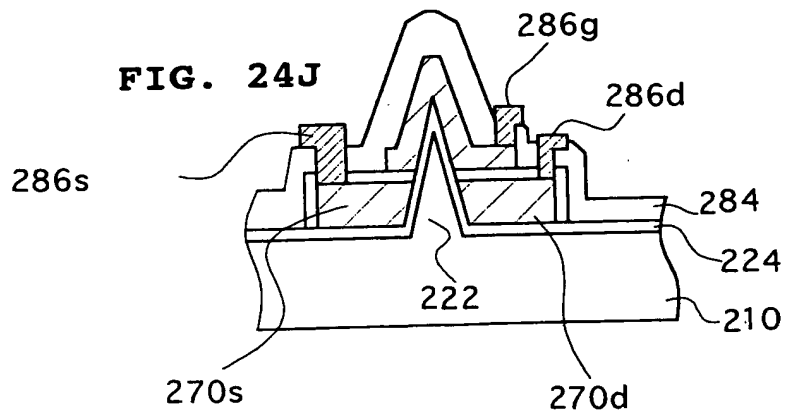
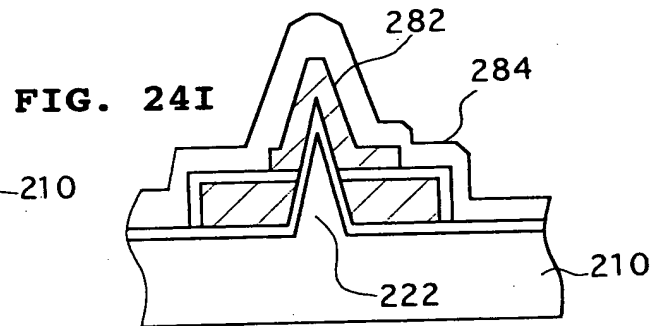
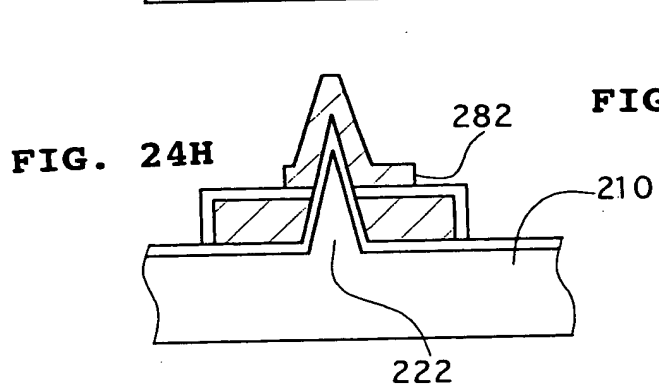
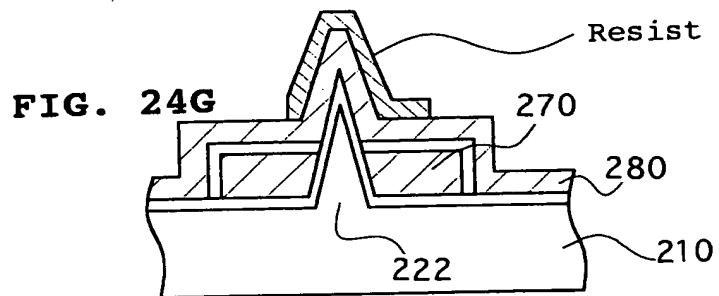
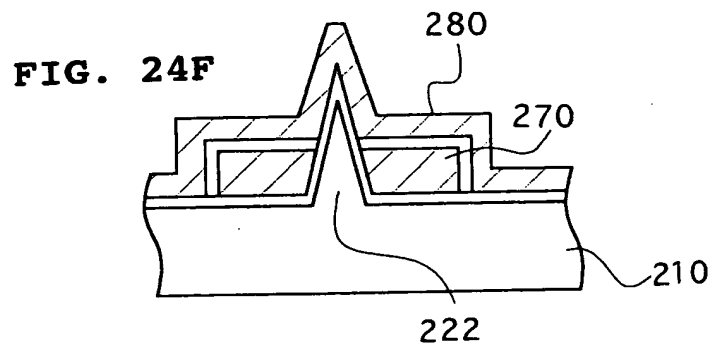


FIG. 24E



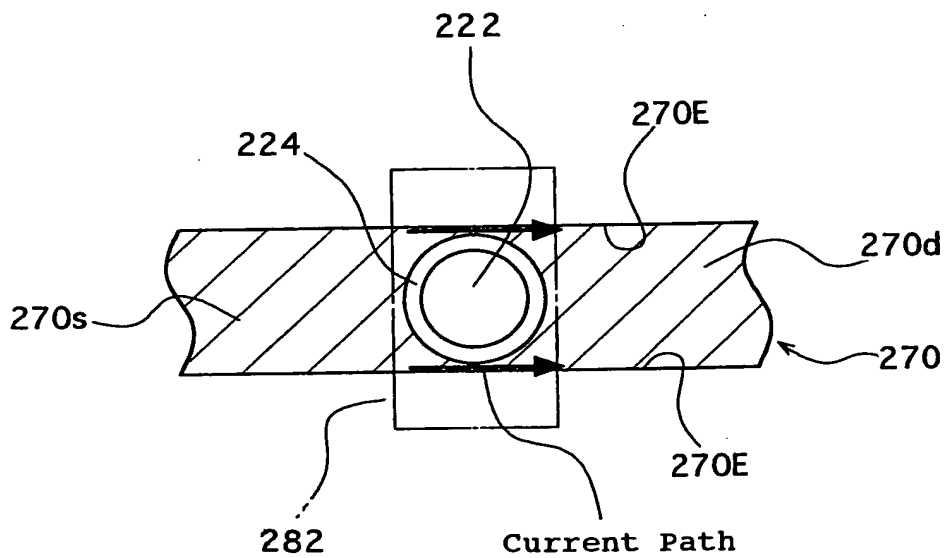


FIG. 25A

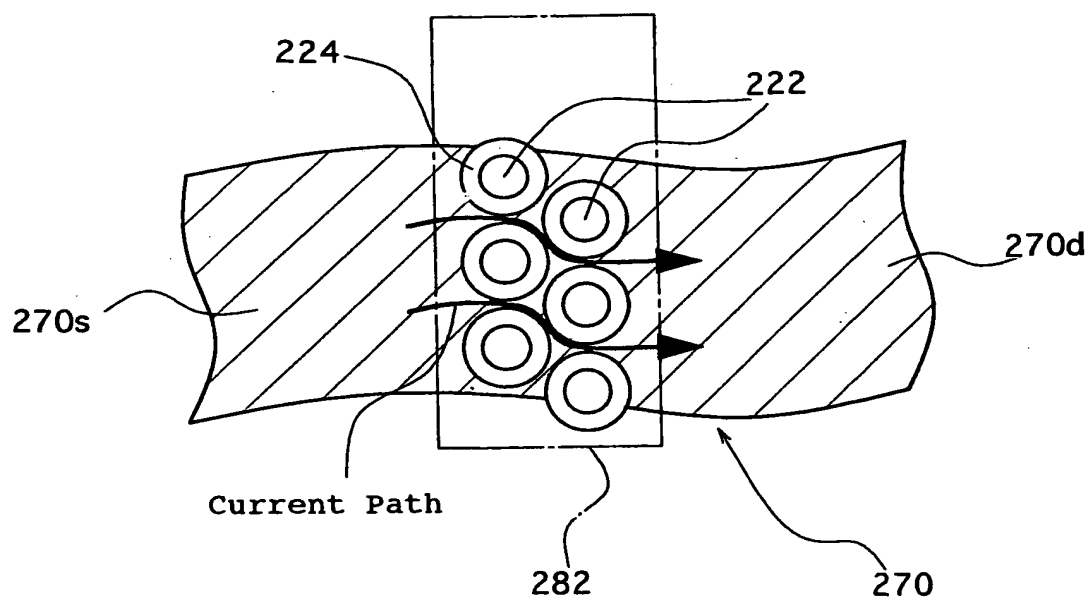


FIG. 25B

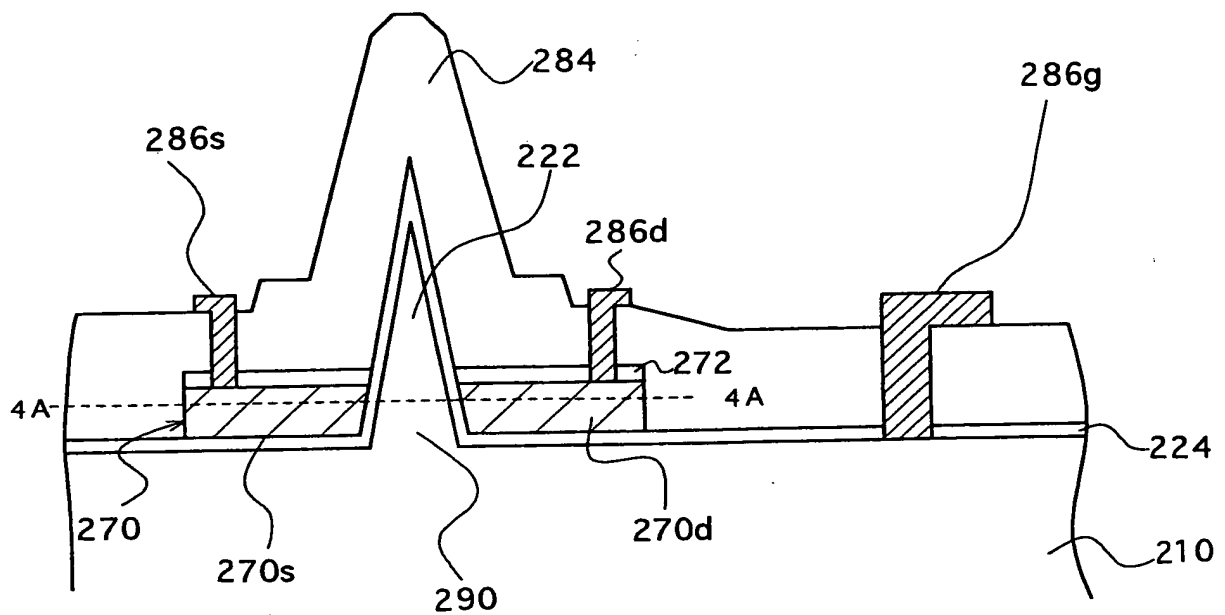


FIG. 26A

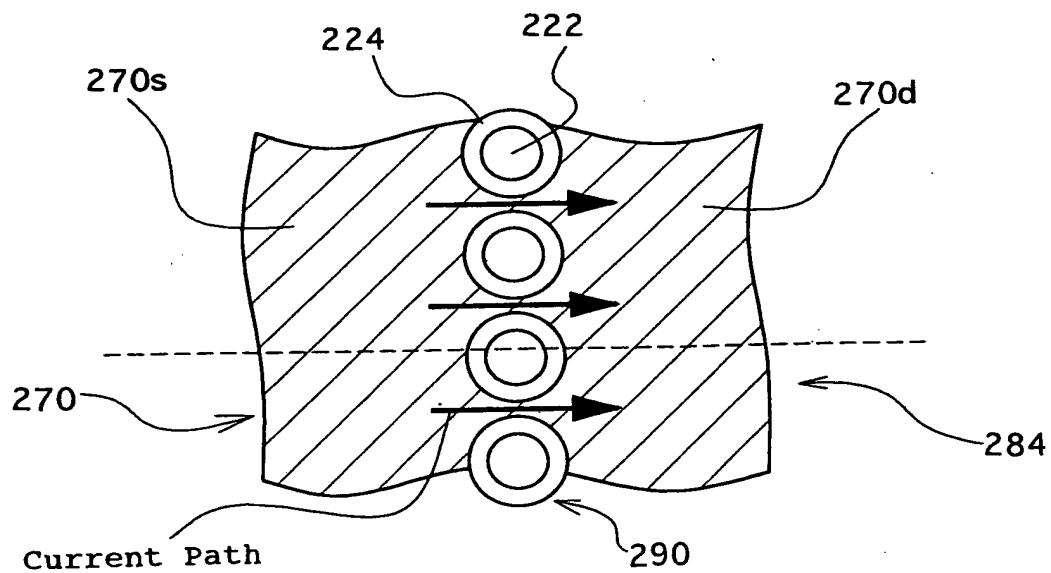


FIG. 26B

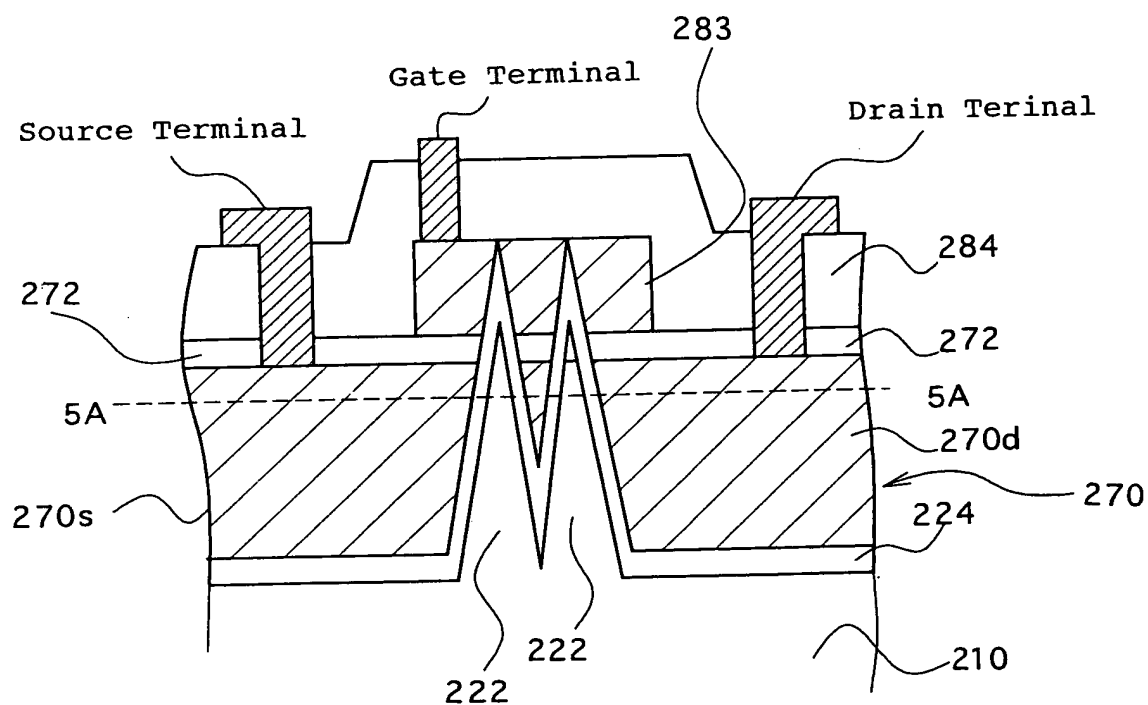


FIG. 27A

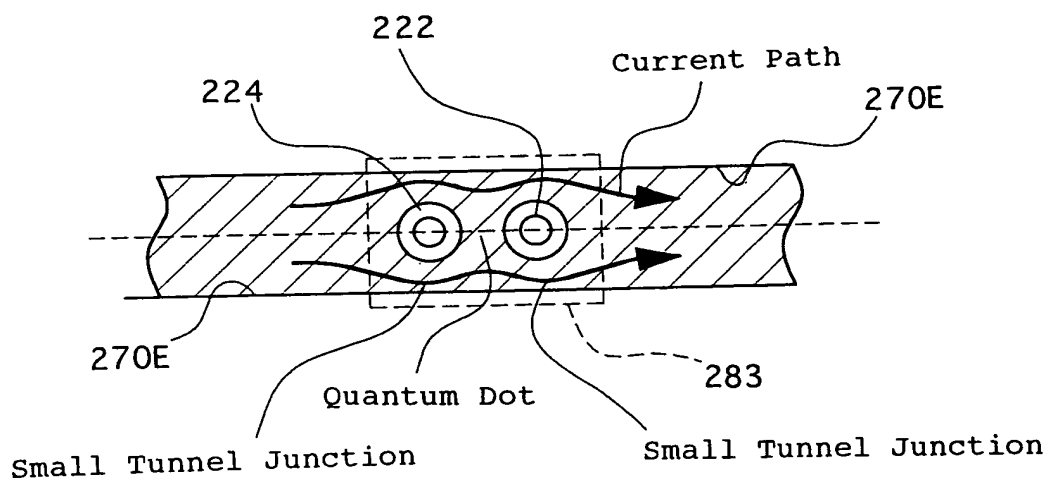


FIG. 27B

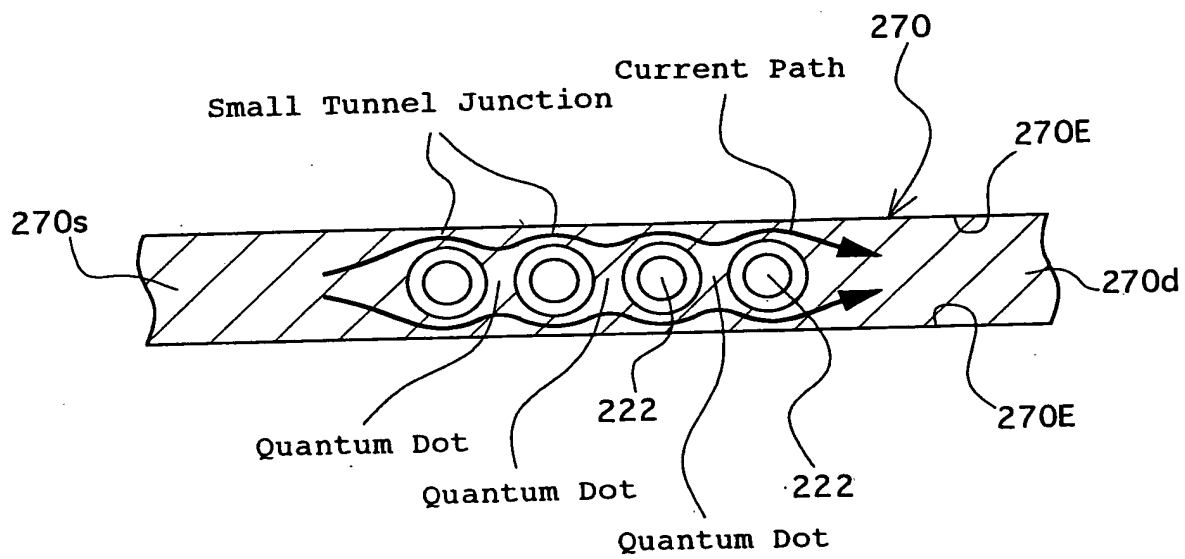


FIG. 28

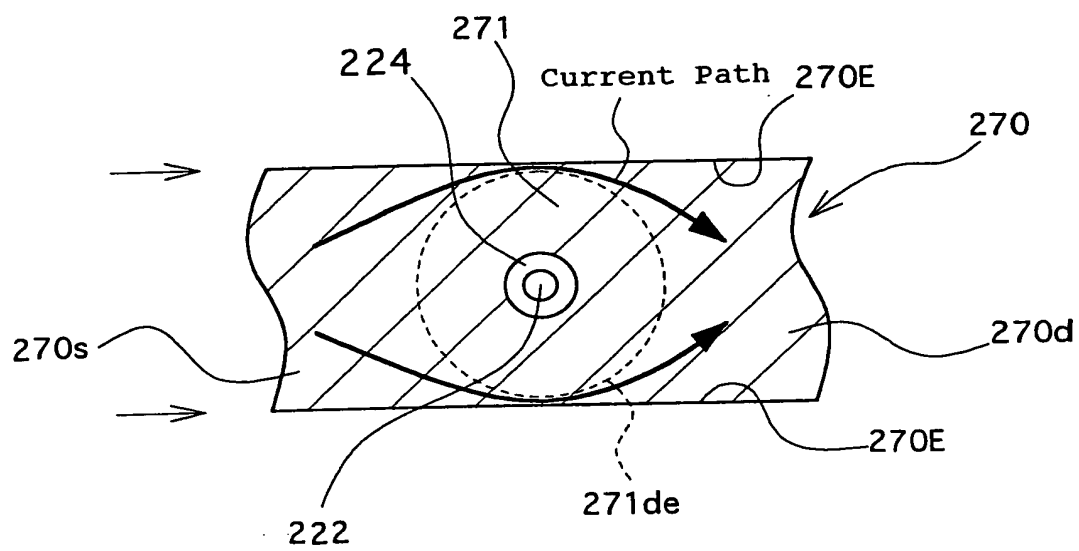


FIG. 30

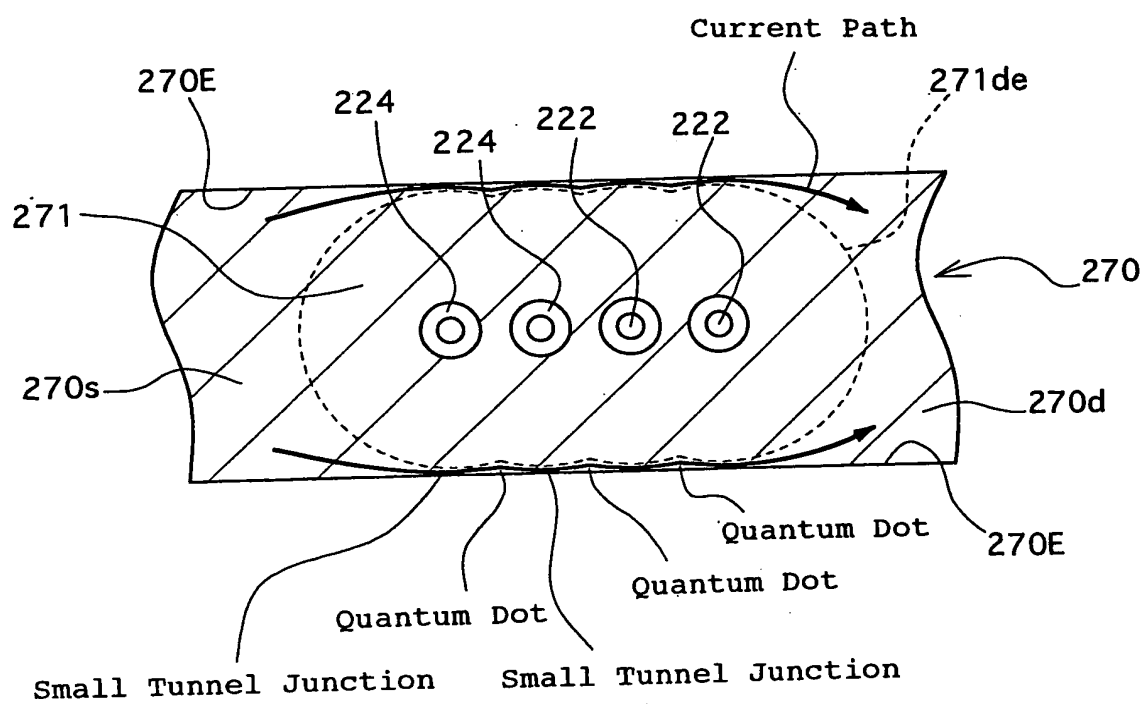


FIG. 31

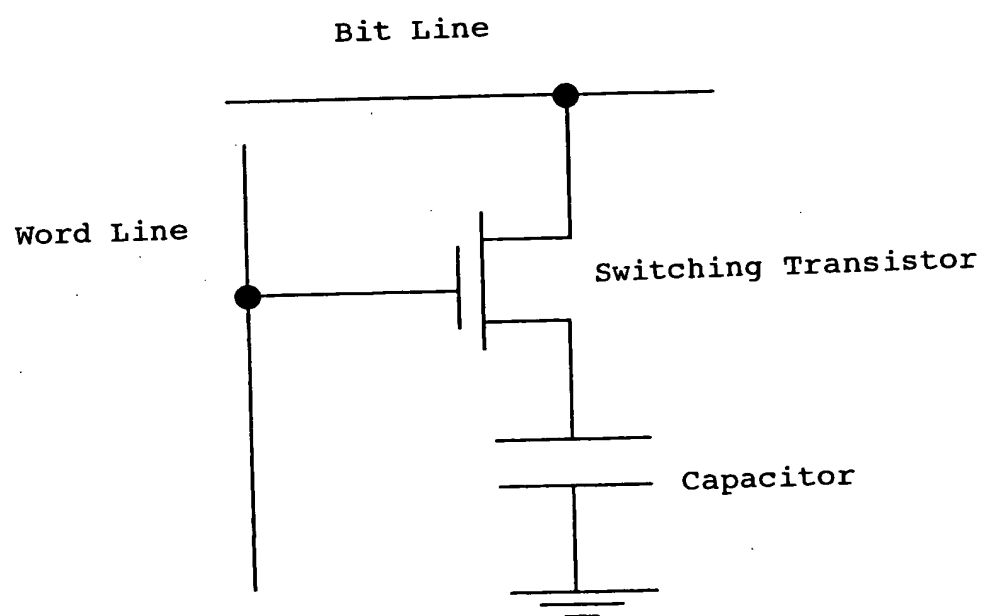


FIG. 32 PRIOR ART

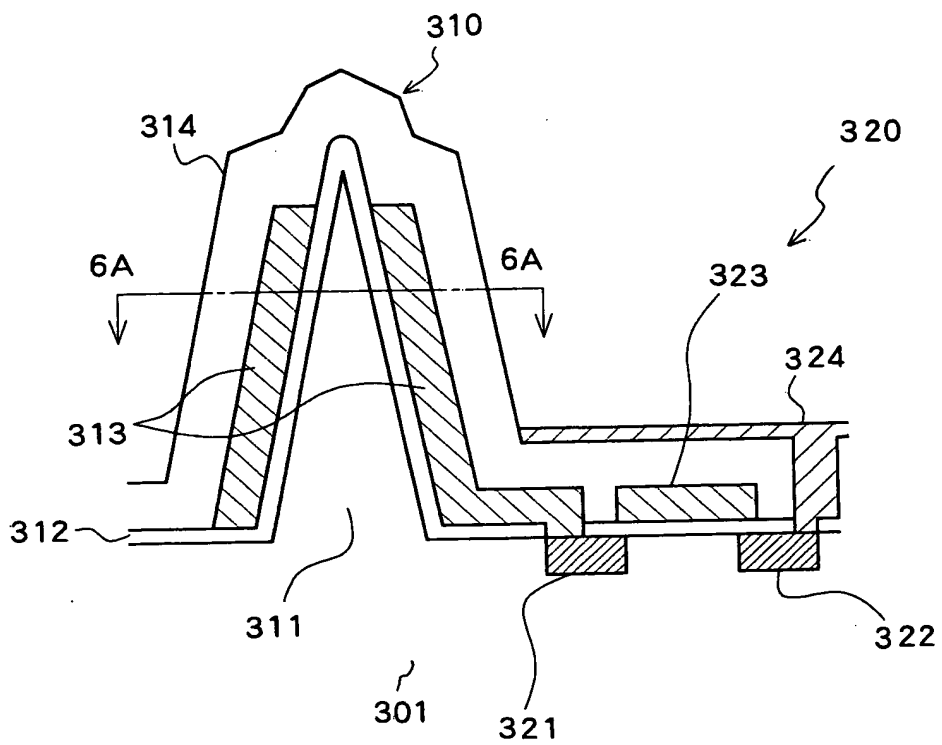


FIG. 33A

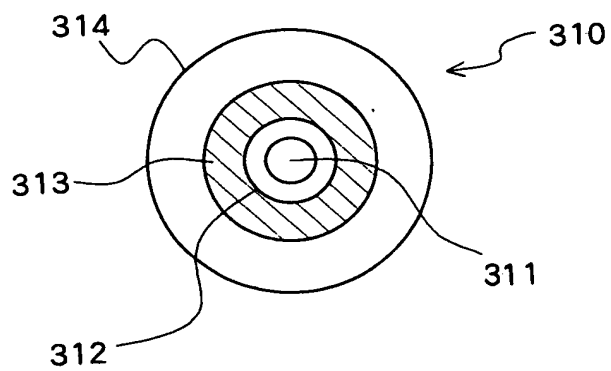


FIG. 33B

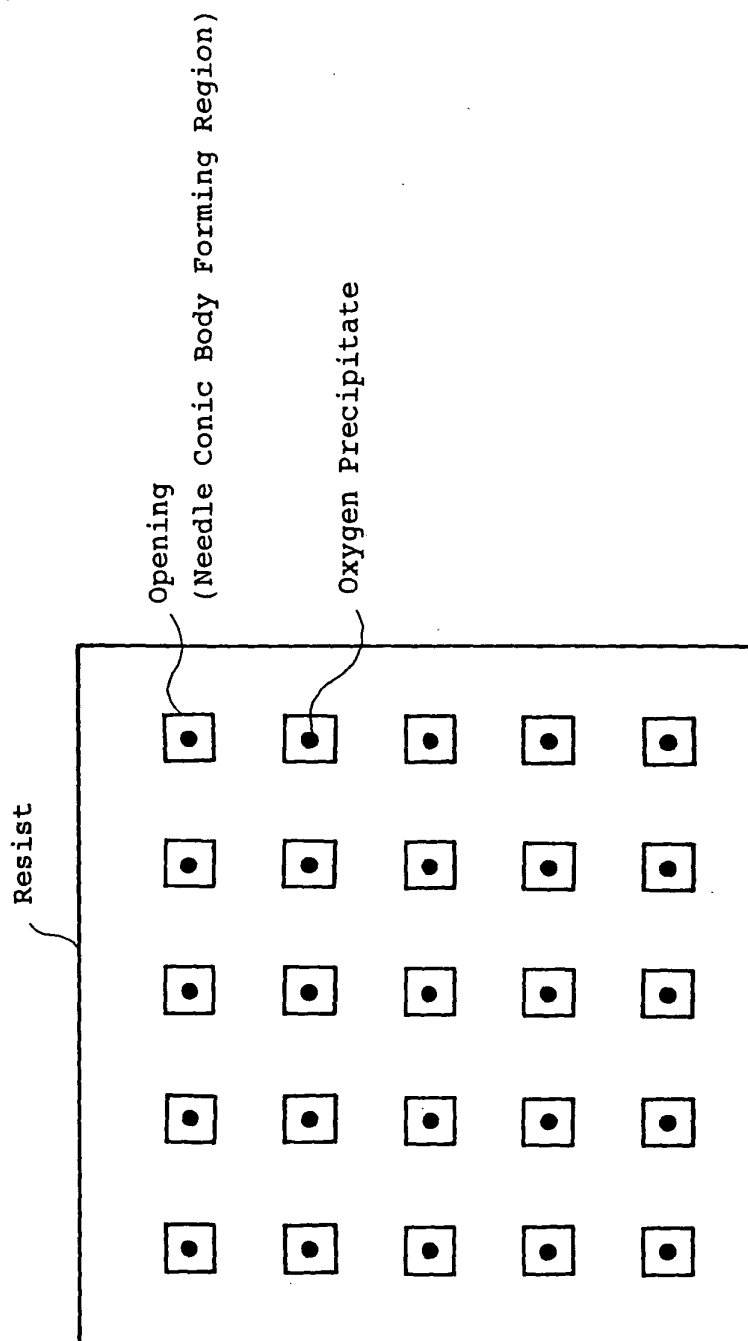
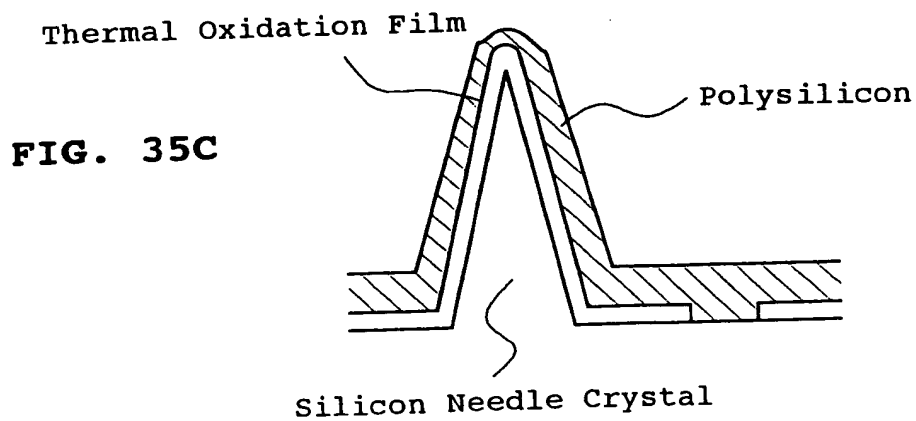
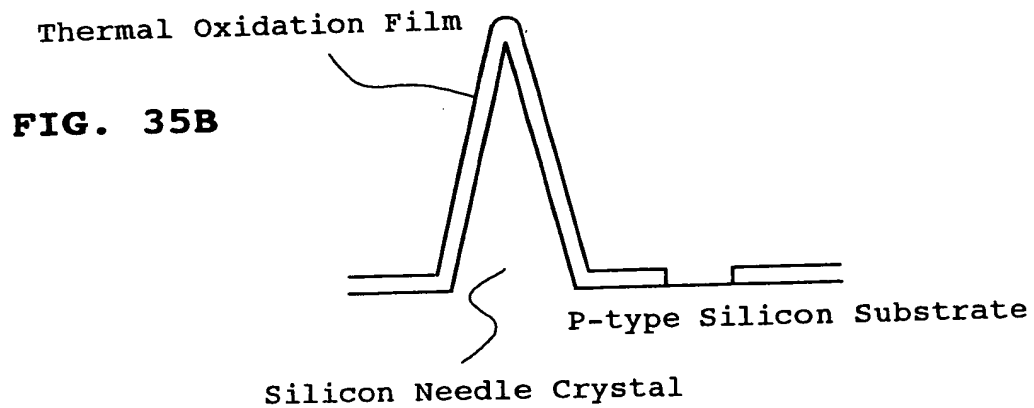
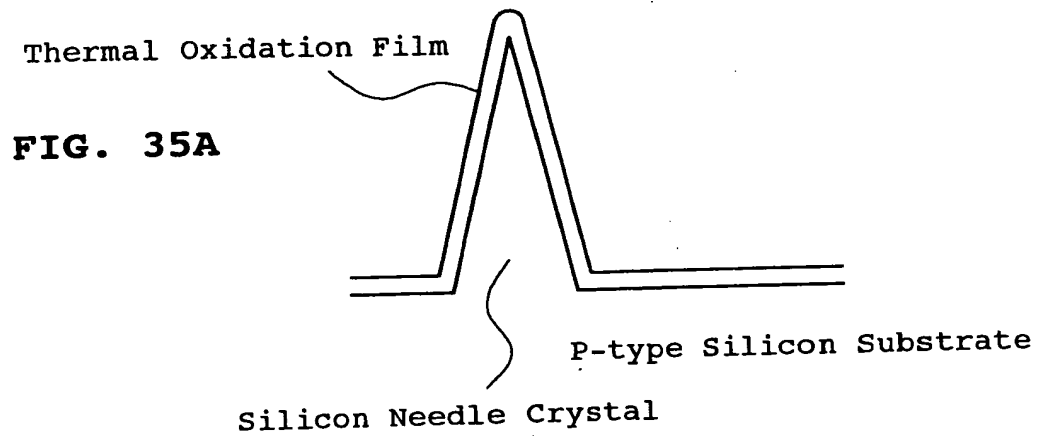
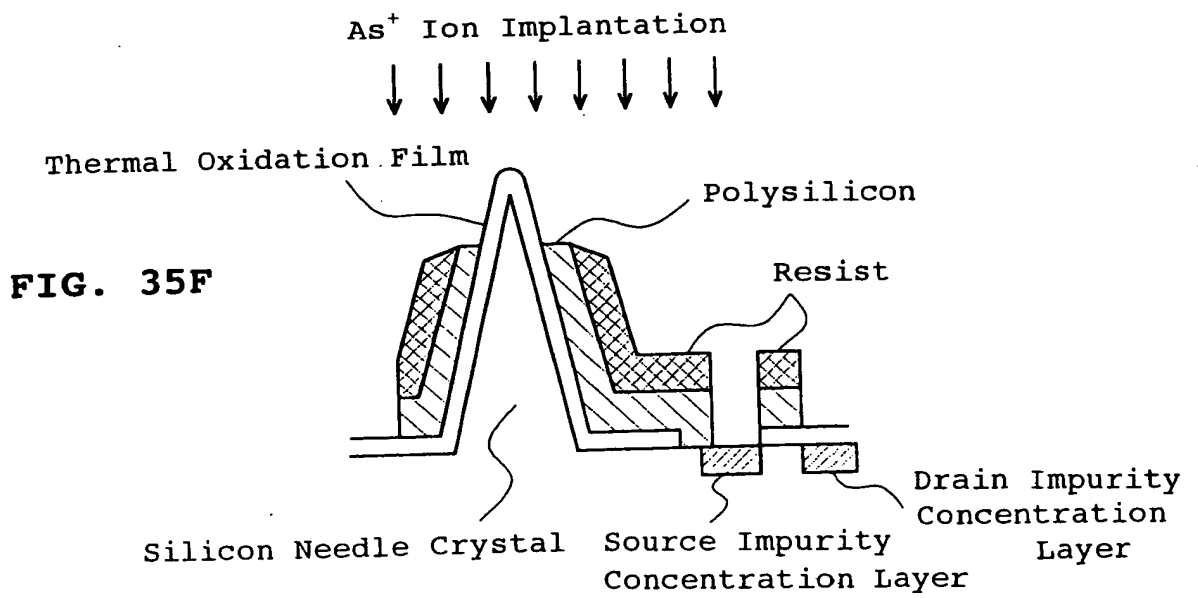
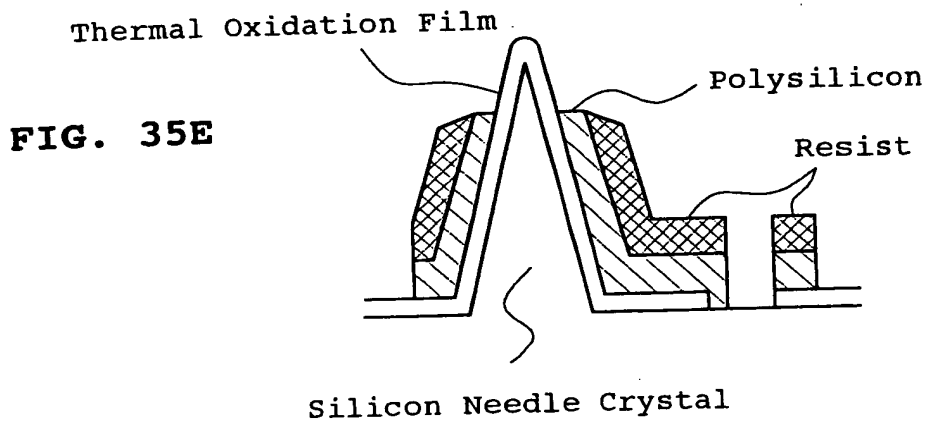
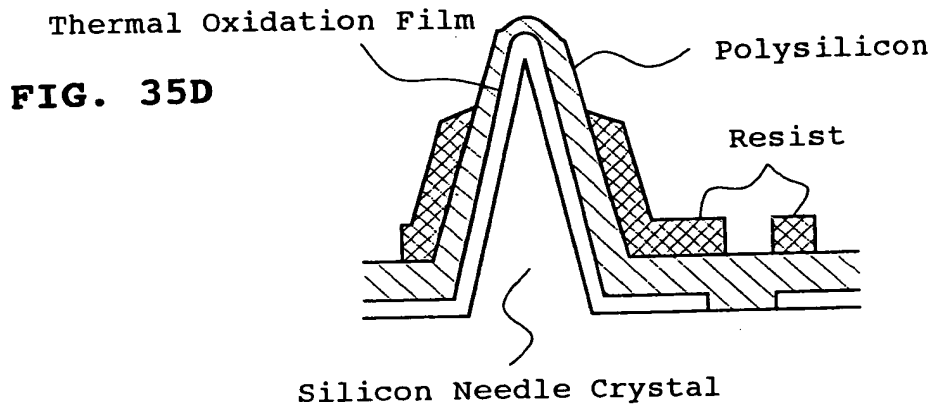
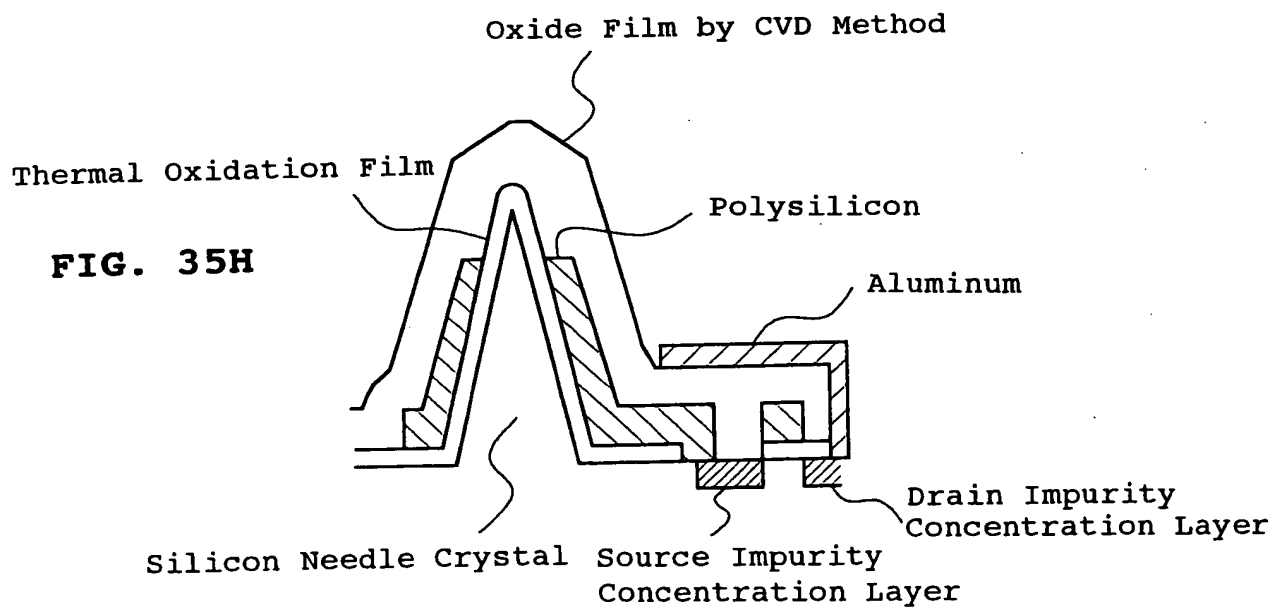
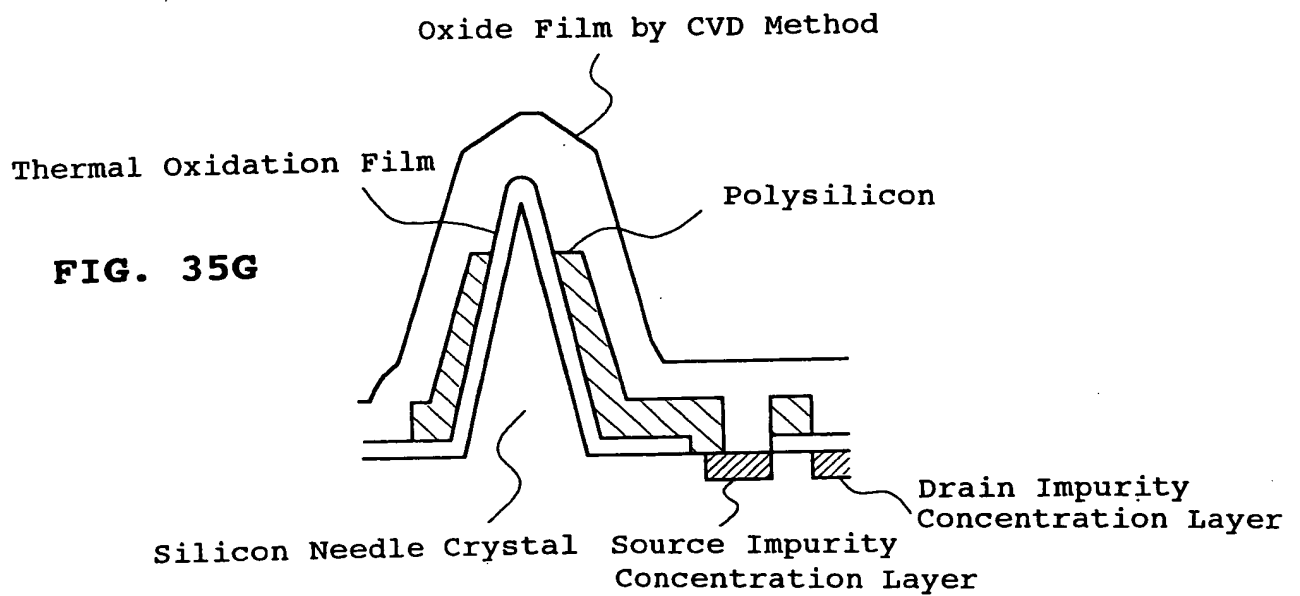


FIG. 34







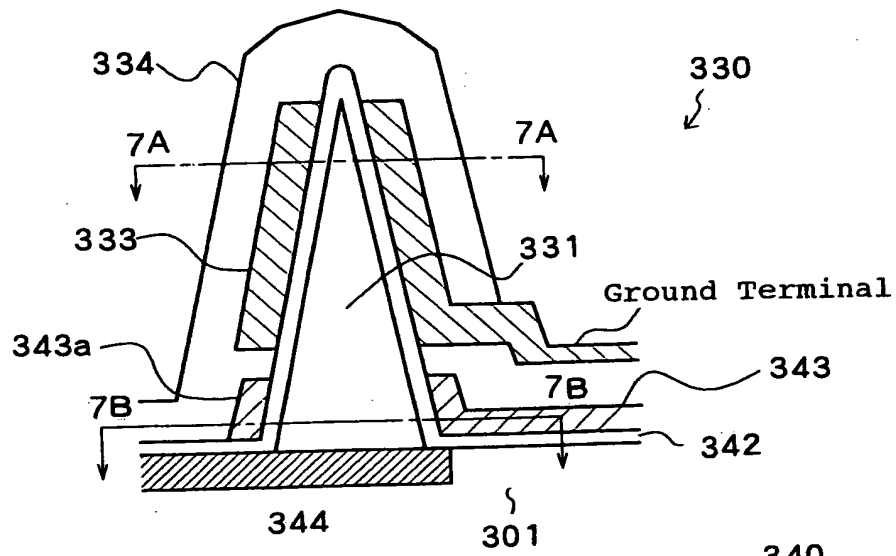


FIG. 36A

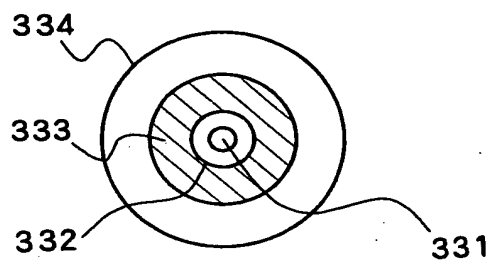


FIG. 36B

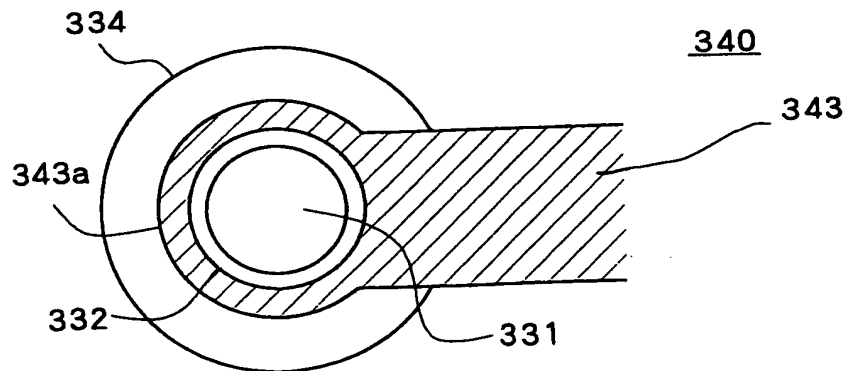
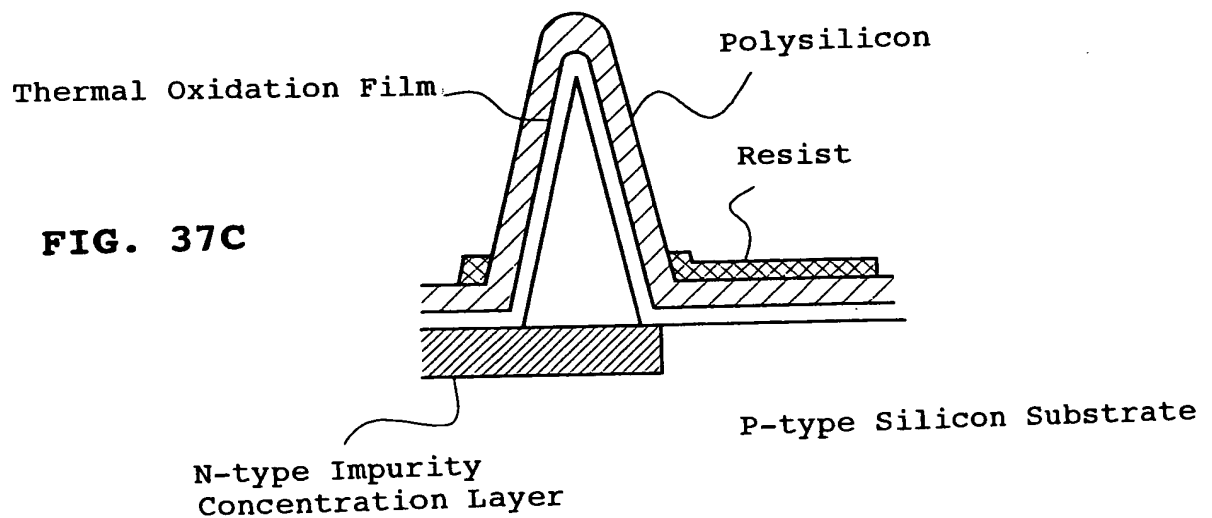
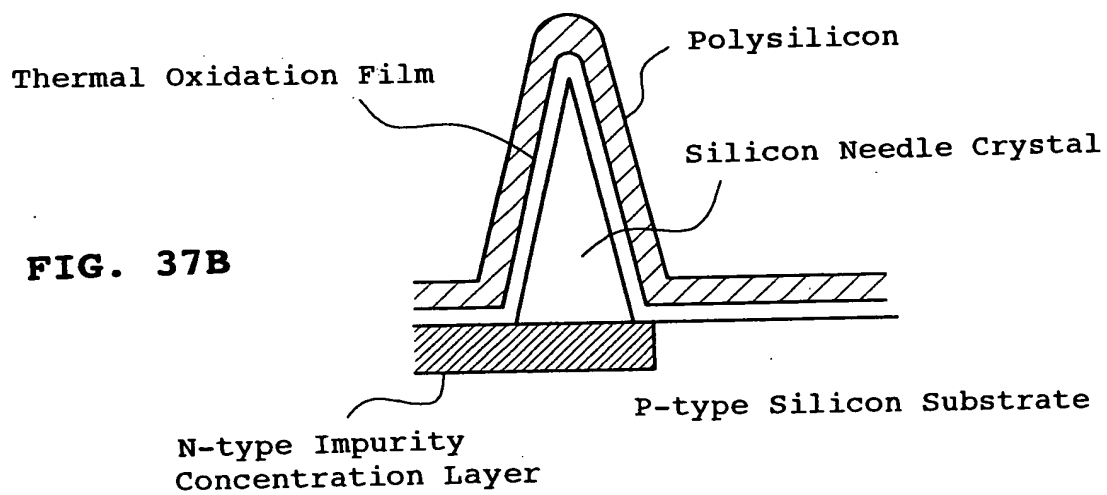
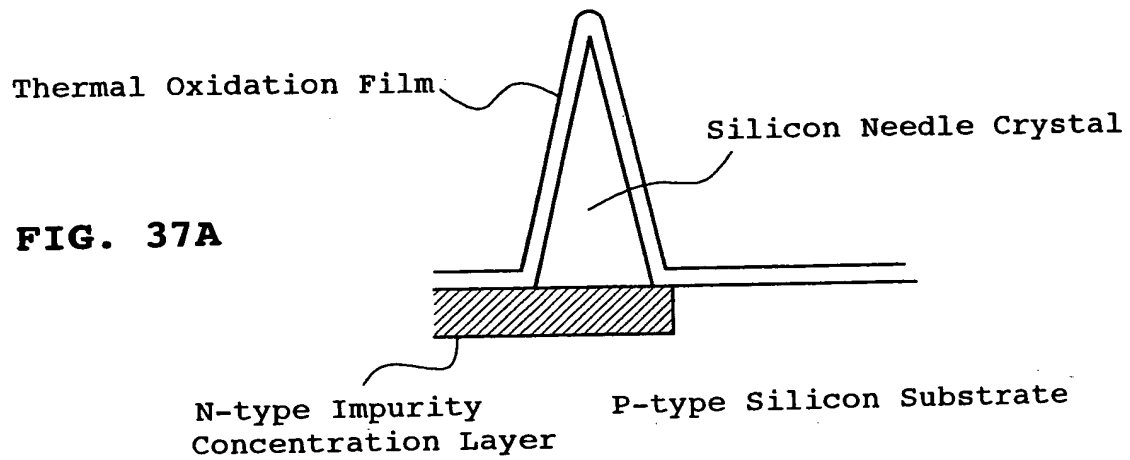
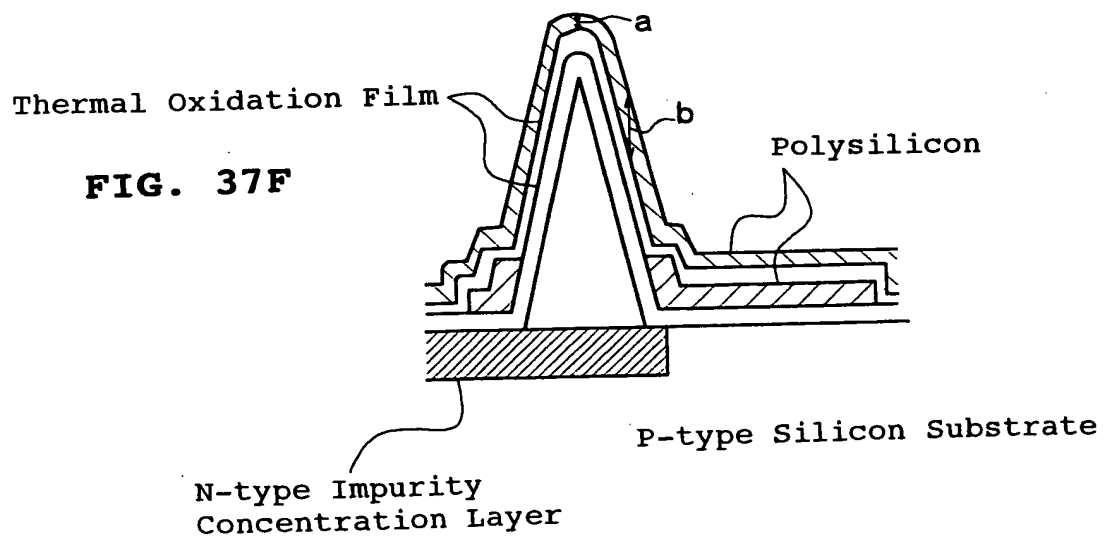
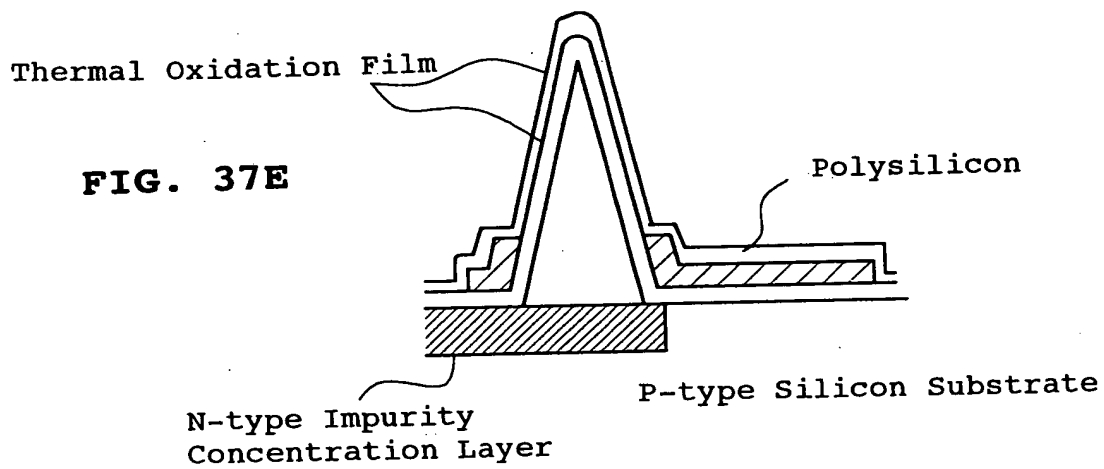
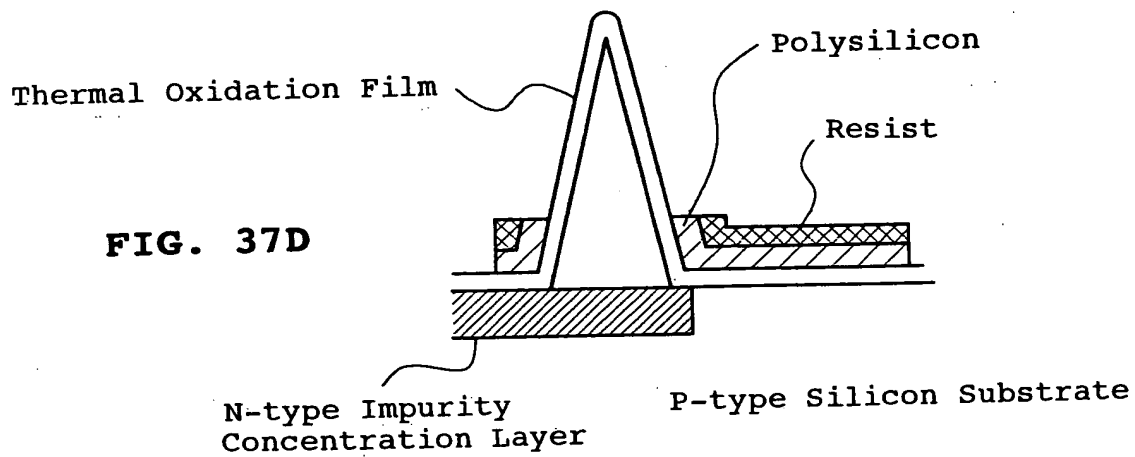


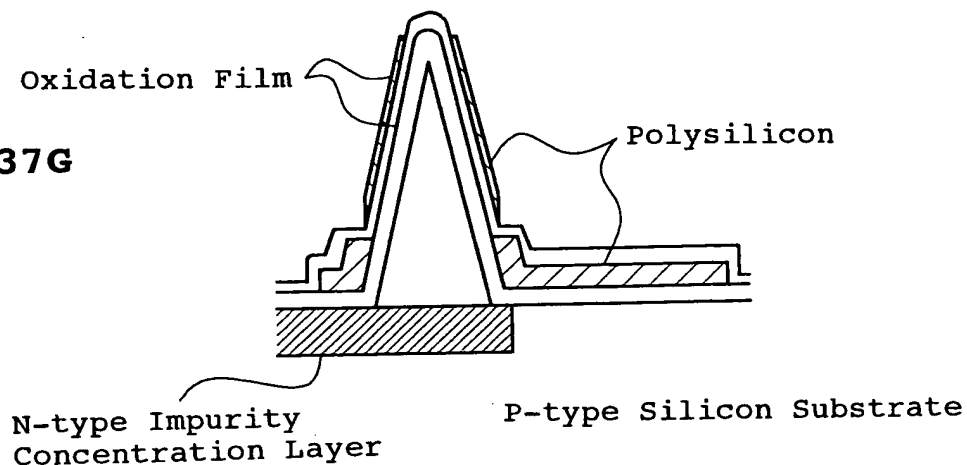
FIG. 36C





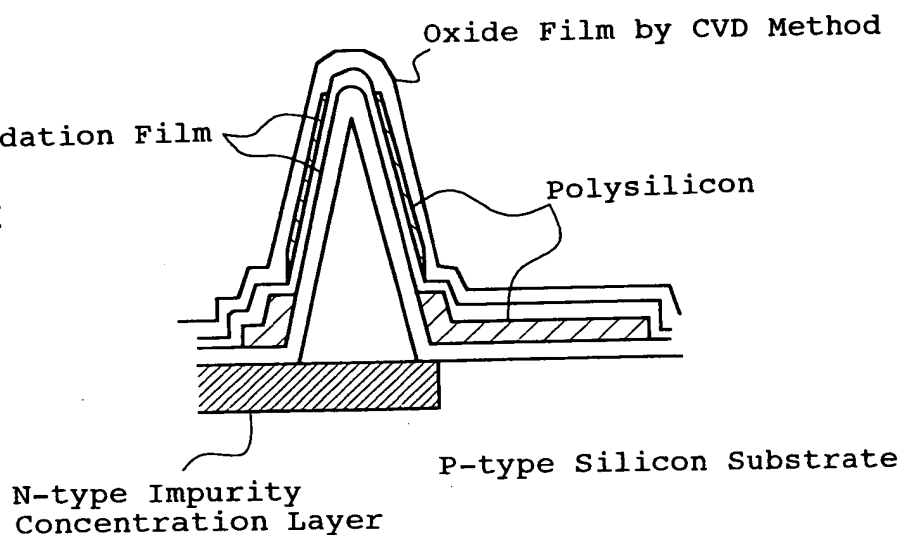
Thermal Oxidation Film

FIG. 37G



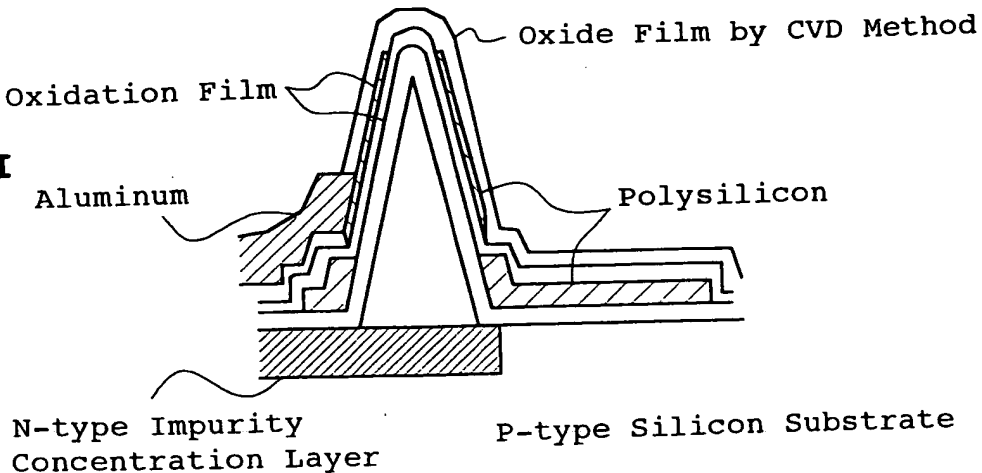
Thermal Oxidation Film

FIG. 37H



Thermal Oxidation Film

FIG. 37I



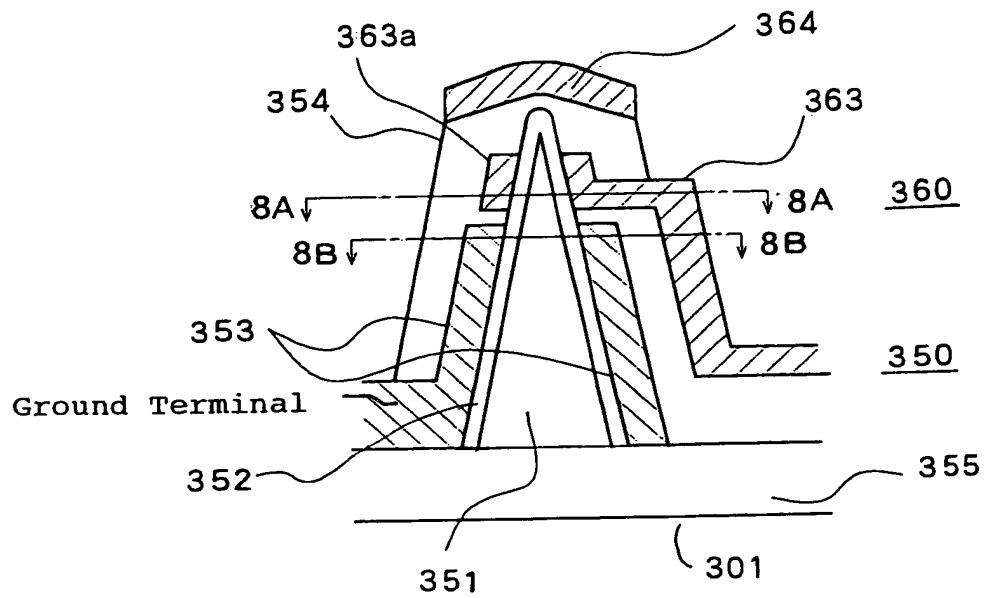


FIG. 38A

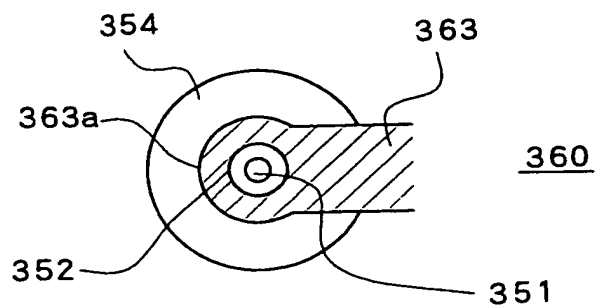


FIG. 38B

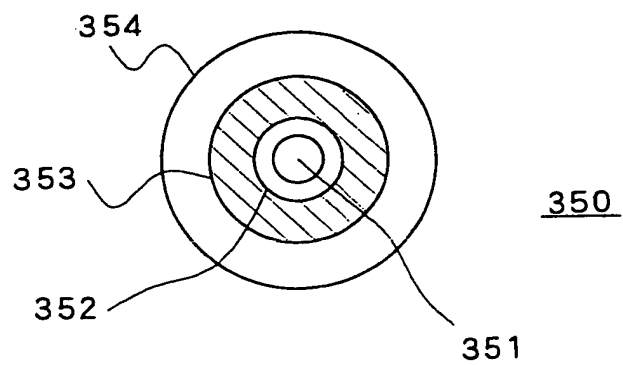


FIG. 38C

